INDIA RUBBER WORLD

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OUR 61st YEAR

A BILL BROTHERS PUBLICATION

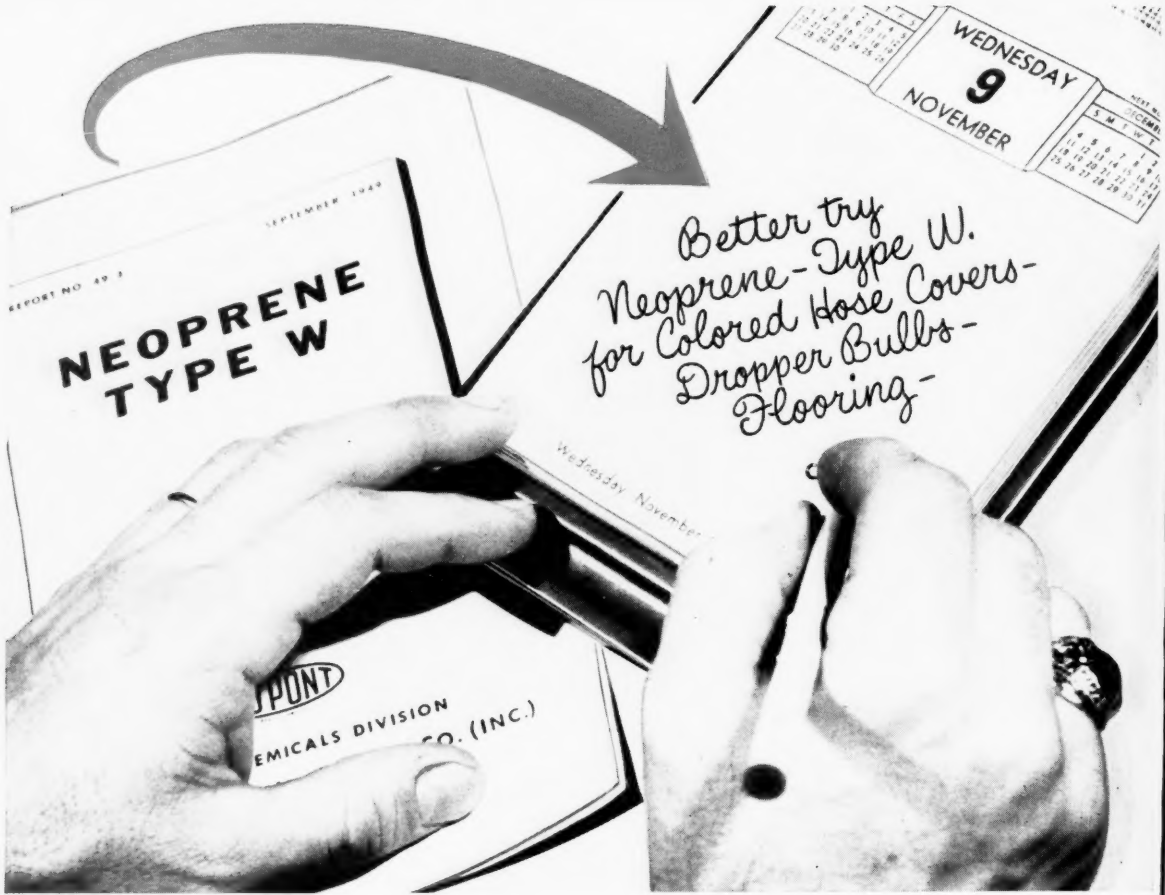
DECEMBER, 1949

A HAPPY CHRISTMAS

...and a Prosperous New Year

CABOT

GODFREY L. CABOT, INC. BOSTON, MASS.



With Neoprene Type W, Du Pont's new, general-purpose neoprene, it is possible to obtain brilliantly colored vulcanizates. Unlike the other neoprenes, properly compounded Type W does not darken during cure. That's why it is well suited to the products this compounder is thinking about. Whether you're already using neoprene in colored goods or not, better try Type W. You will find that it adds "eye appeal" to your products—and savings in pigment costs can often be made.

Remember, too, that Type W has outstanding storage stability. Tests show that even two years' normal storage has practically no effect on its plasticity, processability, scorch resistance or cure rate.

Neoprene Type W also has excellent processing properties. It readily forms a smooth sheet in which compounding ingredients can be dispersed quickly and uniformly. It has exceptional resistance to mill breakdown; won't stick to mill or calender rolls even at high temperatures.

Type W can be vulcanized with conventional rubber accelerators and sulfur. Or, like the other neoprenes, it can be cured without sulfur. With this flexibility in compounding, cure rates can be varied over a wider temperature range.

Try Neoprene Type W at your first opportunity and check its many advantages for yourself. Samples are available on request. Just write:

E. I. du Pont de Nemours & Co. (Inc.), Rubber Chemicals Division, Wilmington 98, Delaware.

. . .

Tune in to Du Pont
"Cavalcade of America,"
Tuesday Nights—NBC Coast to Coast

For complete information on Neoprene Type W, see Report 49-3. Ask for your copy if you haven't received one. See your Du Pont representative or send us your request.

DU PONT RUBBER CHEMICALS

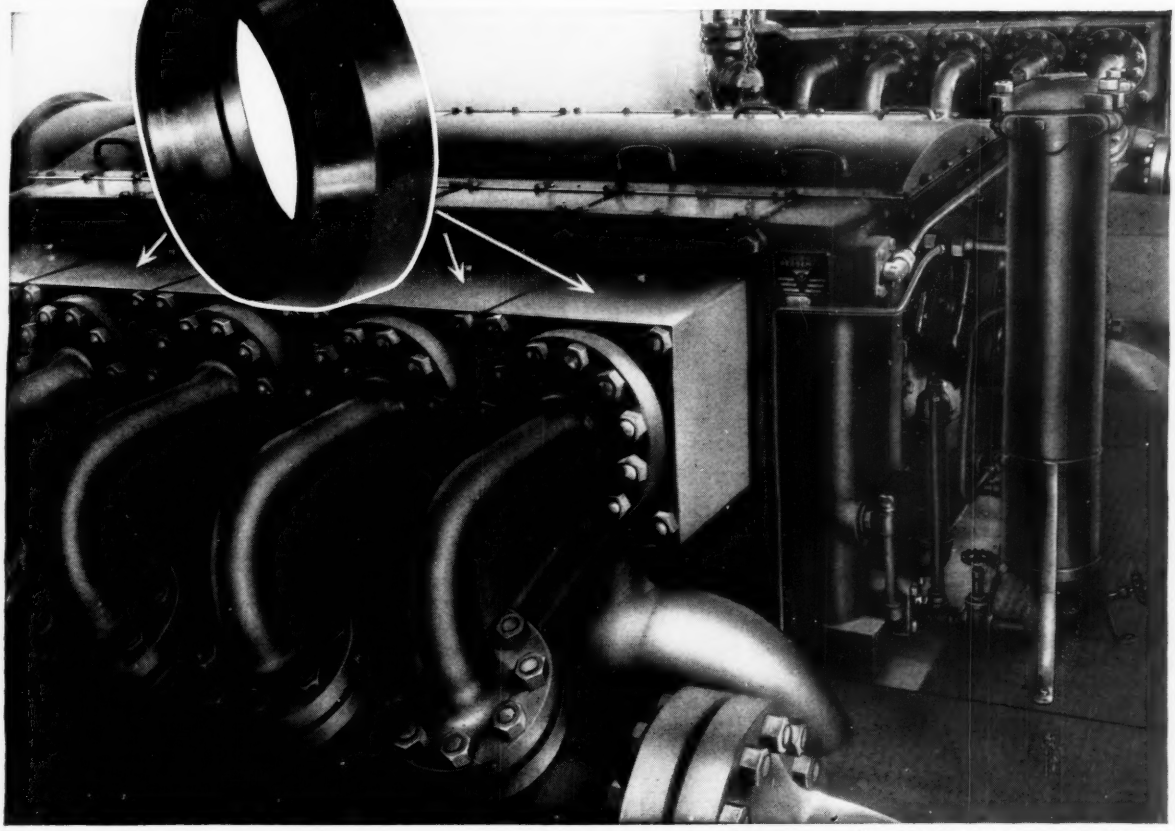
E. I. du Pont de Nemours & Co. (Inc.), Wilmington 98, Del.

DU PONT

BETTER THINGS FOR BETTER LIVING...THROUGH CHEMISTRY

India Rubber World, December, 1949, Vol. 121, No. 3. Published Monthly by Bill Brothers Publishing Corp., Office of Publication, Orange, Conn., with Editorial and Executive Offices at 386 Fourth Avenue, New York 16, N. Y., U.S.A. Entered as Second Class Matter at the Post Office at Orange, Conn., under the act of March 3, 1879. Subscription United States and Mexico, $3.00 per Year; Canada, $4.00; All Other Countries $5.00; Single Copies 35 Cents. Address Mail to New York Office.

← *Packing molded by The Castle Rubber Co., East Butler, Pa.*



Cooper-Bessemer "Twin Line" high pressure liquid pump.

Packing that can take a beating . . . yet fight off oil, too!

LOSS of pressure and leakage of packing lubricant is a common "pump problem", especially where high pressure is involved. But that problem, along with other headaches, was solved in the revolutionary "Twin Line" high pressure liquid pump pictured here. For one of this pump's important features is a well designed plunger sealing ring or packing molded from a Hycar American rubber compound.

These pumps are used wherever liquid is pumped against high pressure—for example, in oil pipe lines, in descaling service in steel mills and in many other fields. The plunger sealing ring, under these severe service conditions, must possess extreme oil and abrasion resistance, low compression set, and excellent aging properties. That's why Hycar was chosen.

Pressure is maintained and lubricant leakage is prevented because the Hycar packing provides lip-type contact with the pump plunger in two directions. The plunger travels at terrific speeds. When operating, one lip of the Hycar packing seals against the pump discharge pressure. The other lip seals against inward leakage of the packing lubricant.

Hycar
Reg. U. S. Pat. Off.
American Rubber

This packing is another example of a tough problem solved because of the unusual combination of properties which Hycar provides. For Hycar resists oil, gas, heat, weather, and wear—and Hycar compounds have excellent resistance to flow under high pressures.

Versatile Hycar may be just what you need to improve or develop a product—to solve a problem—and bring more sales dollars *your* way. It is used as a base material . . . as a plasticizer for polyvinyl resins . . . as a modifier for phenolic resins . . . as an adhesive base . . . as a latex for coating or impregnating. Write for information. Please address Dept. HA-12, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio.

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A MERRY CHRISTMAS
and
A HAPPY NEW YEAR

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a high-styrene copolymer for reinforcing natural and synthetic rubbers. neoprene–gr-s–buna n types.

KRALAC A MAKES SOLING WHICH OUTWEARS LEATHER — BUT

KRALAC A HAS MANY OTHER APPLICATIONS WHICH YOU SHOULD INVESTIGATE FOR YOUR PRODUCTS

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- **WIRE** Reinforced wire insulation
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Write for Special Bulletin on KRALAC A

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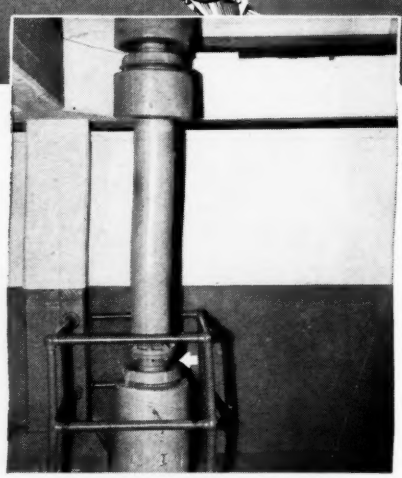
Great mechanical marvels of today use the Barco Flexible Joint for fluid-conveying pipes. Barco has flexibility, provides responsive movement through every angle, absorbs vibration and compensates for expansion and contraction. There is a complete range of Barco designs for transportation and industrial needs. The technical skill of our experienced engineering department is ready to help you with your joint problems. Write Barco Manufacturing Co., 1810 Winnemac Avenue, Chicago 40, Illinois. In Canada: The Holden Co., Ltd., Montreal, Canada.



HOW BARCO KEEPS A STEAM PIPE FLEXIBLE:

In this Los Angeles office building, the floors are suspended and allowed about 7 inches sway to compensate for earthquake shocks. Barco Joints, because they compensate for expansion and contraction, permit flexibility in the steam pipes of this building.

BARCO FLEXIBLE JOINTS

Not just a swivel joint ...but a combination of a swivel and ball joint with rotary motion and responsive movement through every angle.

FREE ENTERPRISE—THE CORNERSTONE OF AMERICAN PROSPERITY

"MOVE IN EVERY DIRECTION"

New answer to the "scorch problem" ..in tire tread processing

HERE'S a new and successful accelerator-retarder combination for rubber compounders. It permits use of *all* the advantages of reinforcing furnace blacks in natural rubber tire tread formulations— *without scorching.*

And, it provides these additional advantages:

1. Low heat build-up.
2. Good flex life and high abrasion resistance.
3. Improved resilience and compression set.
4. Easy handling and processing.

Good-rite Erie is an excellent delayed action accelerator. Good-rite Vultrol is a highly effective retarder at processing temperature.

Send for complete information about these widely and successfully used rubber chemicals. Please write Dept. CA-6, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio.

B. F. Goodrich Chemical Company A DIVISION OF THE B. F. GOODRICH COMPANY

GEON polyvinyl materials • HYCAR American rubber • GOOD-RITE chemicals and plasticizers

Do your rubber products say **"Come hither"?**

Use Du Pont **"Alamask"** odorants
TRADE-MARK

Nobody wants to buy a product with an unpleasant odor! But now—with Du Pont "Alamask" odorants—both your natural, neoprene and other synthetic rubber products can have a clean and pleasing odor. Unpleasant odors can be neutralized throughout.

Du Pont odor chemists, working with rubber technologists, have developed a series of "Alamask" odorants. These carefully tested odorants neutralize off-odors or give a pleasant scent, whichever you desire. You'll use them successfully on Latex, bonded fibers, adhesives, dipped goods, blown sponge and many other rubber products. There is no significant effect on processing characteristics or rate of cure.

Du Pont **"Alamask"** odorants
TRADE-MARK

Du Pont laboratory skill is at your service. Send for the booklet "Odorants for the Rubber Industry"—or ask us for specific recommendations for your individual problems. Write—E. I. du Pont de Nemours & Co. (Inc.), Organic Chemicals Department, Aromatics Section, Wilmington 98, Delaware. Branch Offices: Atlanta, Boston, Charlotte, Chicago, New York, Philadelphia, Providence, San Francisco.

DU PONT
REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

NEW BANBURY RUBBER RECLAIMER AND DEVULCANIZER

PRODUCES HIGH QUALITY RECLAIM AT EXTREMELY LOW COST

In one simple operation, this specially built Banbury will reclaim unvulcanized, partly cured and completely cured stocks. Being a mechanical process, it requires only a brief overall cycle.

Every plant which has a quantity of morgue stock, uncured frictions, mold overflow, backed uncured trimmings, or completely cured stocks, should investigate the unique possibilities of this new process.

This process is covered by patents under which licenses are available on reasonable terms. Details will be furnished on request.

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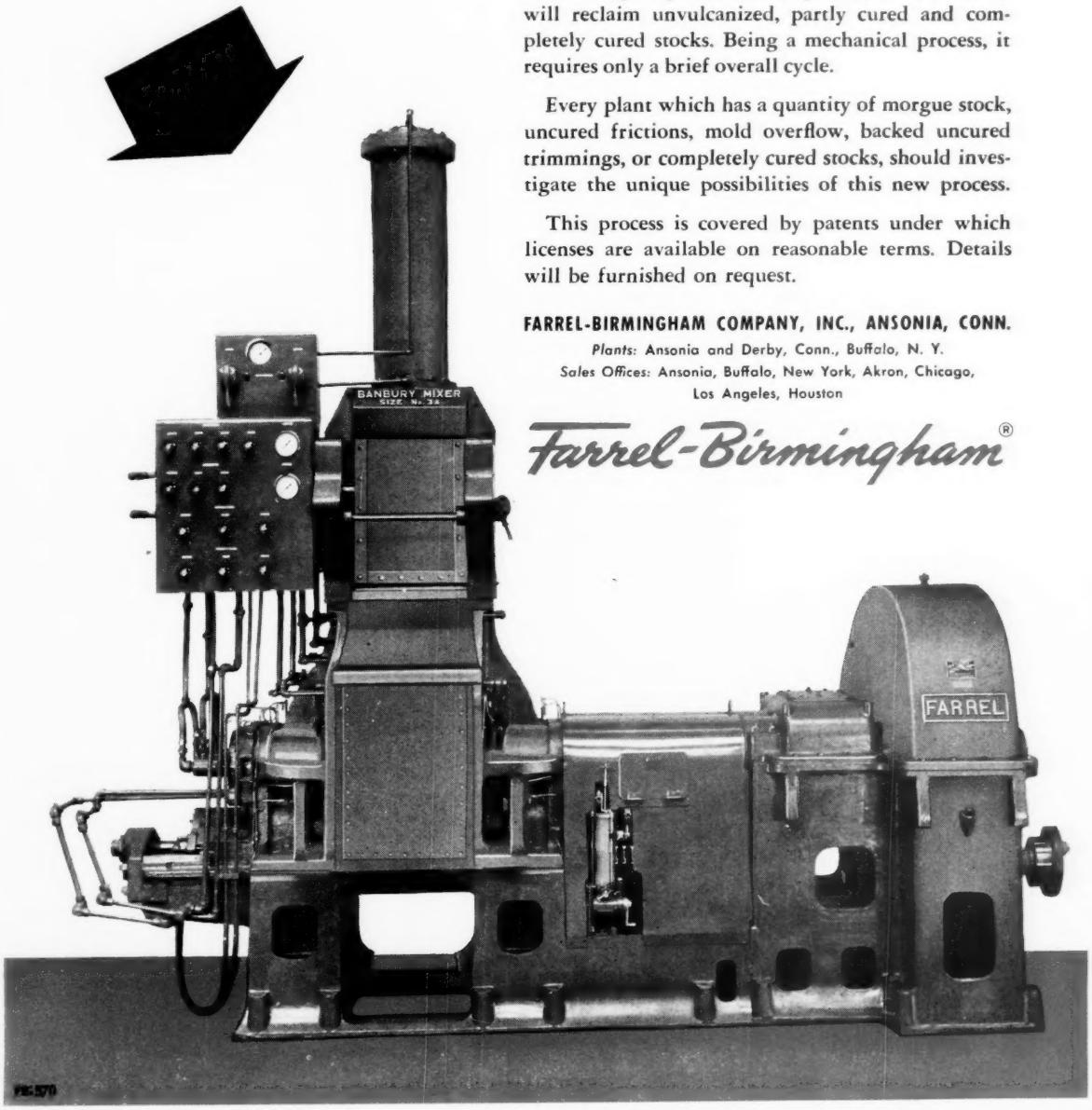

Size and shape of pigment particles important factor in behavior of rubber products

Through constant research on its basic products, Witco endeavors to increase the available knowledge concerning the behavior of rubber-like polymers from the familiar natural product to the newest of the low temperature synthetics.

Fundamental research has shown that among the important factors determining the behavior of rubber products is the size and shape of the pigment particles used in the compound.

In the case of carbon black, the particles appear to be aggregates or chains of spherical or ellipsoidal units, such as shown in the accompanying electron micrographs. The size of these units in a carbon black is closely connected with the tensile, tear, tint and re-bound of the rubber compounded with the black. The shape of the chain-like particles is related to the stiffening effect of the black, that is, to the modulus and hardness of the cured compound.

Technical Service Report CB-1 gives the results of this research project in greater detail. A copy is yours for the asking. Simply use the coupon below.

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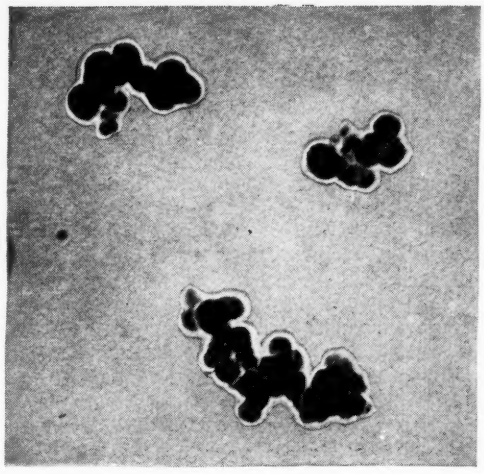
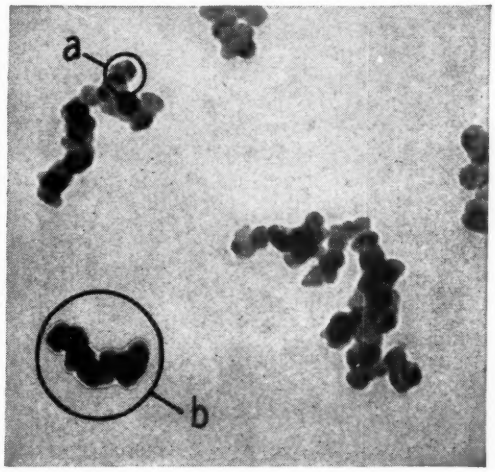
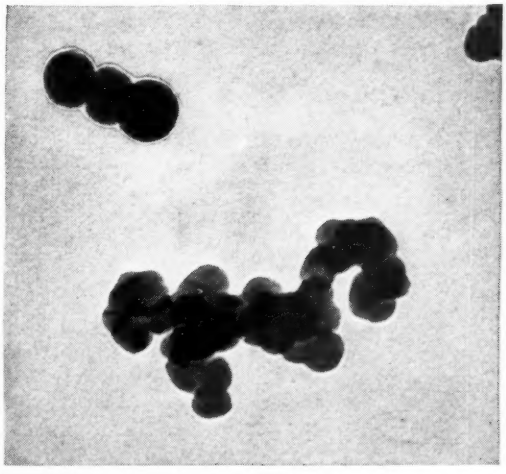


Continental A (MPC)—Witco No. 1
Average ellipsoidal unit diameter, millimicrons.....27
Specific surface area, square meters per gram.....89
Average shape factor*.....5.9

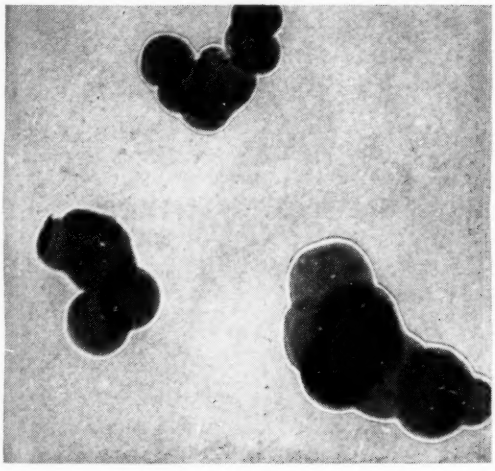
**Average of longest dimension of the particle aggregates divided by average diameter of the particles in the aggregate. The higher the shape factor, the more pronounced the "structure".*



Continental AA (EPC)—Witco No. 12
Average ellipsoidal unit diameter, millimicrons....33
Specific surface area, square meters per gram.....70
Average shape factor.....7.1



Continex HMF
Average ellipsoidal unit diameter, millimicrons.....60
Specific surface area, square meters per gram.....36
Average shape factor.....6.0



Continex SRF, SRF-NS
Average ellipsoidal unit diameter, millimicrons.....98
Specific surface area, square meters per gram.....23
Average shape factor.....6.4

WITCO CHEMICAL COMPANY
Technical Service Department
295 Madison Avenue, New York 17, N. Y.

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The modern machinery in this Compound Plant includes:

- Banbury Mixer, size nine
- Record Blanking Unit
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Through TITANOX-A (anatase titanium dioxide), the strongest whitening power available in a white pigment has been utilized in time-proven natural rubber compounds for white wall tires possessing whiteness plus resistance to discoloration, checking and cracking. In this type of compound, although anatase titanium dioxide has been preferred because of exceptional whiteness, the rutile type—TITANOX-RA—in view of greater brightening power may also be used. The use of synthetic rubber plus natural rubber in the newer type of compounding often results in an inherently darker compound which calls for the greater brightening power of the rutile pigment—TITANOX-RA. To promote further resistance to discoloration, checking and cracking, the weather-resistant rutile pigment—TITANOX-RA-NC—may be called upon in these newer compounds. Whether your preference runs to the older or the newer types of white wall compounds we are ready to help you at any time through technical service. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; 104 South Michigan Avenue, Chicago 3, Ill.; 2600 South Eastern Avenue, Los Angeles 22, Calif. Branches in all other principal cities.

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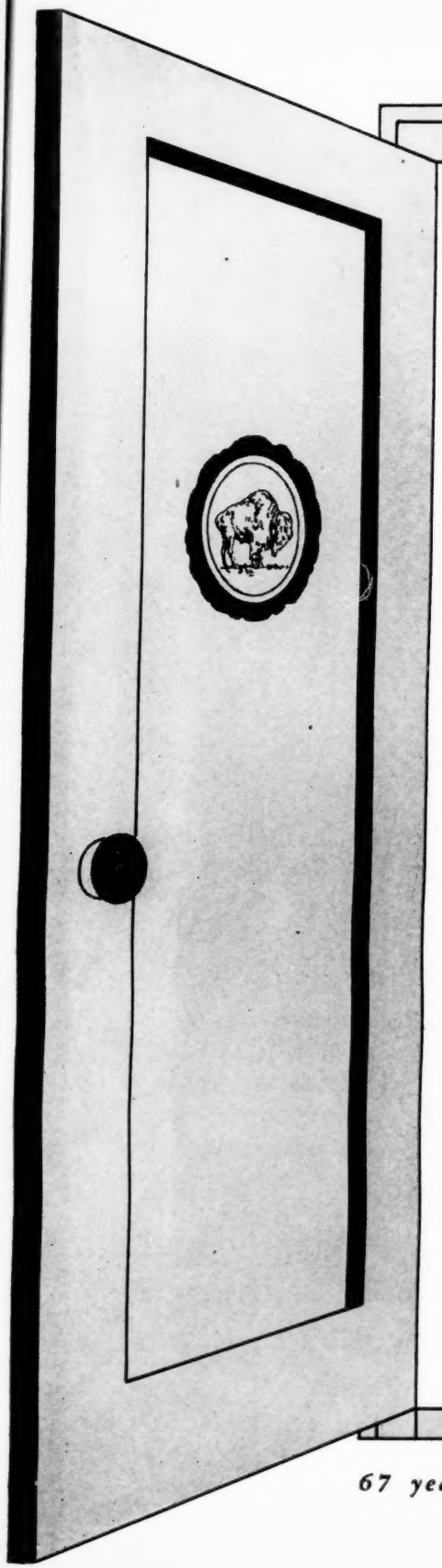

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With the establishment of our home offices in the Buffalo industrial area, we have completed an expansion program designed to meet the increasing demands for our products. This consolidation of administrative, sales and manufacturing functions in one central location will enable us to offer better-than-ever service to the entire industry.

Yes, U. S. Rubber Reclaiming Co., Inc. is on the move. New offices — A new, modern plant — New "DIP" Process Reclaims — all aimed at meeting the ever-changing demands of rubber manufacturers for new and better types of reclaimed rubber.

U. S. RUBBER RECLAIMING COMPANY, INC.

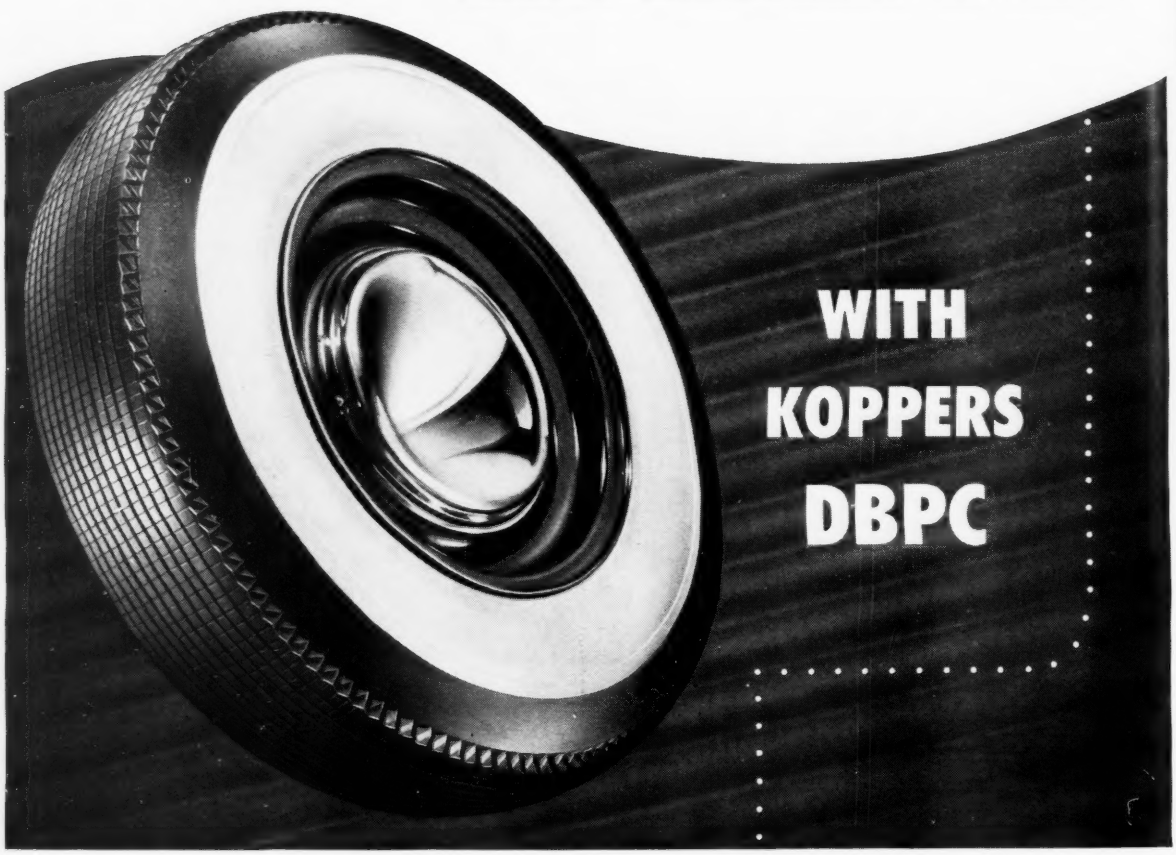
BUFFALO, N. Y.

Trenton—H. M. Royal, Inc., 689 Pennington Ave.

67 years serving the industry solely as reclaimers

How to obtain *effective age-resistance*

without discoloration or stain



WHITE SIDEWALL TIRES. Added to rubber compounds from which "white sidewalls" are fabricated, Koppers DBPC give age-resistance without causing discoloration.

MOST rubber compounds require the addition of an antioxidant material for age-resisting properties . . . to prevent cracking, checking, hardening and loss of strength. But most antioxidants tend to discolor the finished product or to stain materials with which they come in contact.

For white rubber products . . . white sidewall tires, crepe-soled shoes, sponge rubber cushions, sanitary goods, refrigerator gaskets, and the like . . . Koppers offers you Di-tert-butyl para-cresol (DBPC). Tests have shown that DBPC is an effective antioxidant with non-discoloring and non-staining qualities.

The effectiveness of Koppers DBPC as a rubber antioxidant in comparison with other commercially available antioxidants is discussed in detail in Bulletin C-9-115-2. Write for this bulletin and for other literature on DBPC. Send your requests to Koppers Company, Inc., Chemical Division, Dept. IRW-12, Pittsburgh 19, Pa.

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KOPPERS COMPANY, INC.

Chemical Division

Pittsburgh 19, Pa.

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Our footwear is being made at the rate of more than 100,000 pairs per day in more than twenty countries.

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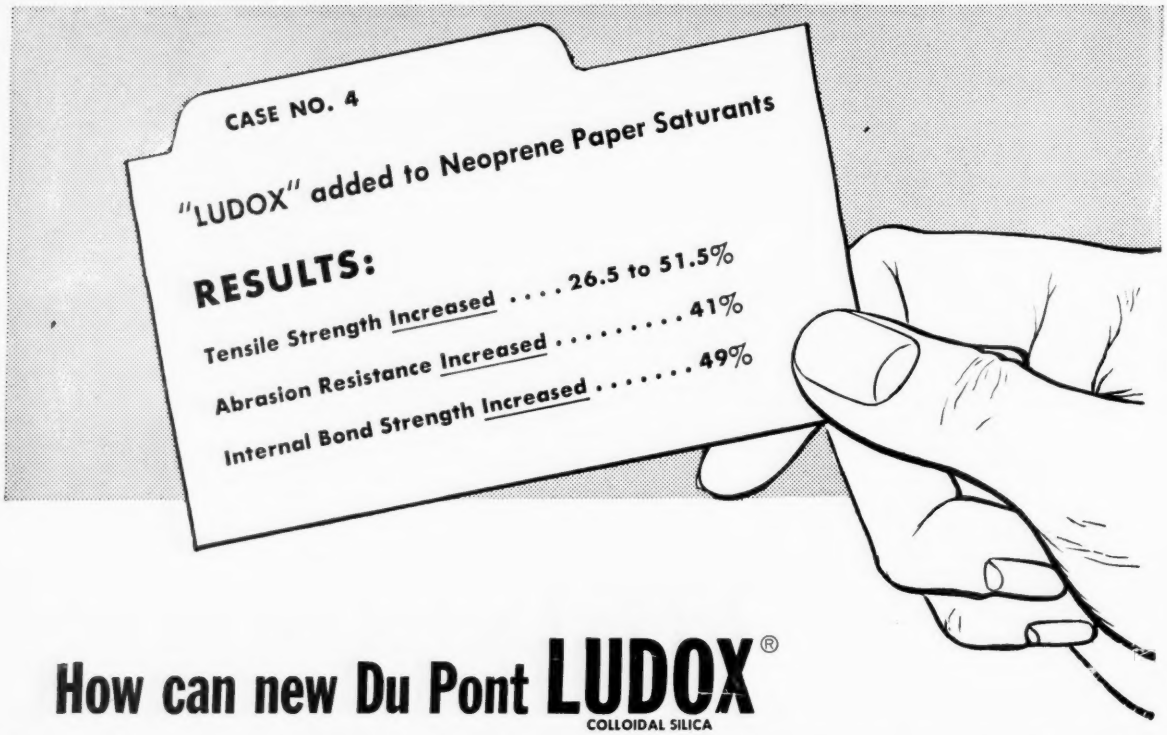
Waynesville, North Carolina
United States of America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How can new Du Pont LUDOX®
COLLOIDAL SILICA

improve your latex products...broaden your markets?

Whether you produce latex adhesives, thread, dipped or coated goods, it is highly probable that "Ludox" can help you make new or better products that can lead to broader markets.

For greater use with maximum economy, "Ludox" comes to you as a 30% colloidal solution of colorless, almost pure silica particles, less than 1 1,000,000 inch in size. Here are some other examples of what it can do for you:

ADHESIVES: "Ludox" strengthens —up to *3* times—latex adhesion to a wide variety of surfaces, including fabric, leather and metal.

FILMS AND COATINGS: Greatly increased modulus, abrasion resistance and reduced water swelling are obtained when "Ludox" is added to synthetic latex films and coatings.

THREAD: Relatively small amounts of "Ludox" nearly double the modulus of neoprene thread.

FOAM: In neoprene foam, approximately 20% less sponge solids are required to obtain a given modulus—with no adverse effect on flex life, bend flex and compression set.

IN ADDITION, other ways of applying "Ludox" profitably in the rubber field are being developed.

HOW CAN YOU USE "LUDOX"? A Du Pont Technical Representative will be glad to visit your plant and study your problems.

Get These Helpful Facts

Clip the coupon below for the latest Technical bulletin on "Ludox" for latex products.

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Interested in "Ludox" in_____
(Type of product or products)

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saves 62.4% and 56.4%

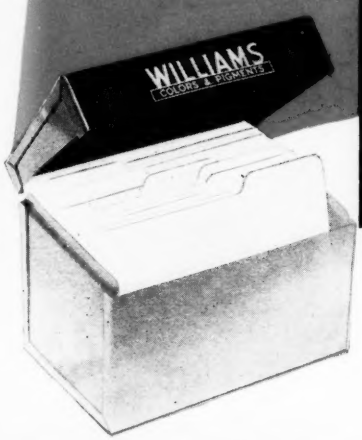
ON COLOR COSTS!

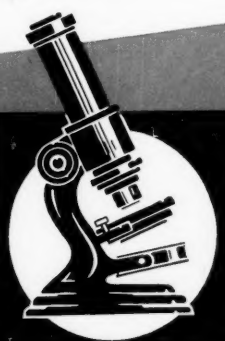
A large rubber company, manufacturing an olive drab colored stock, consulted us about the possibility of simplifying the pigment composition—and reducing the color cost.

The rubber company's original formula called for a blend of 5 separate colors—one of them organic. Working from this formula, C. K. Williams & Co. developed two blends of less expensive inorganic pigments. These two blends consisted of 4 colors—and were basically stable, permanent iron oxides.

The recommended pigmentations were checked in the Williams laboratory for perfect color matching—and also for such physical characteristics as tensile strength, tear resistance, and oxygen bomb aging.

Both proved to be satisfactory in all respects—and their costs were 62.4% and 56.4% below that of the combination previously used.





LET WILLIAMS PUT THE MICROSCOPE ON *Your* COLOR PROBLEM

Whatever your color problem, bring it to Williams. As shown by this case history—and many similar histories in our files—Williams can often save you time and money on proper color formulation.

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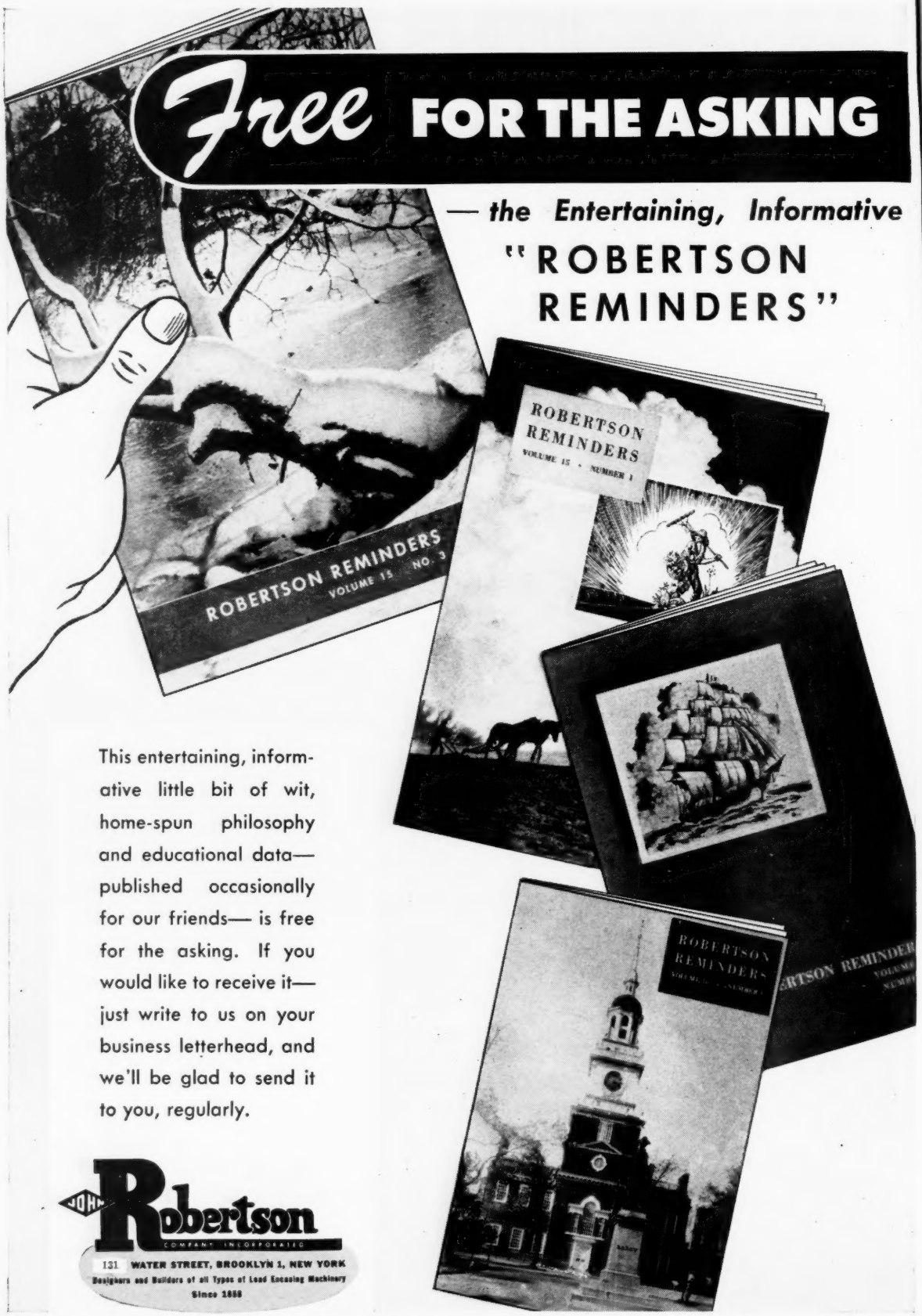

This entertaining, informative little bit of wit, home-spun philosophy and educational data— published occasionally for our friends— is free for the asking. If you would like to receive it— just write to us on your business letterhead, and we'll be glad to send it to you, regularly.

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...and a Prosperous New Year

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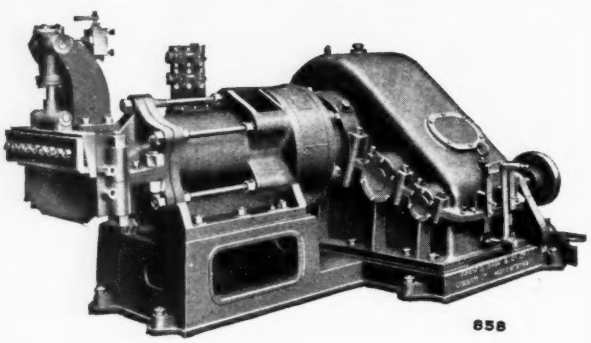

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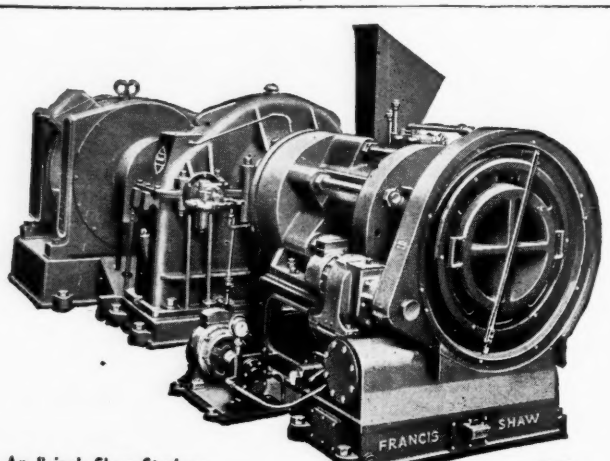
An 8-inch Shaw Extruder
for Tyre Tread Production

We have been making all types of extruders for the rubber industry since 1879

Your enquiries will receive the benefit of over 65 years experience in the design and manufacture of sound machines.

WE CAN EQUIP COMPLETE TYRE PLANTS AND GENERAL RUBBER PROCESSING FACTORIES WITH MACHINERY PRODUCED ON MODERN PLANT BY SKILLED WORKMEN AND TECHNICIANS.

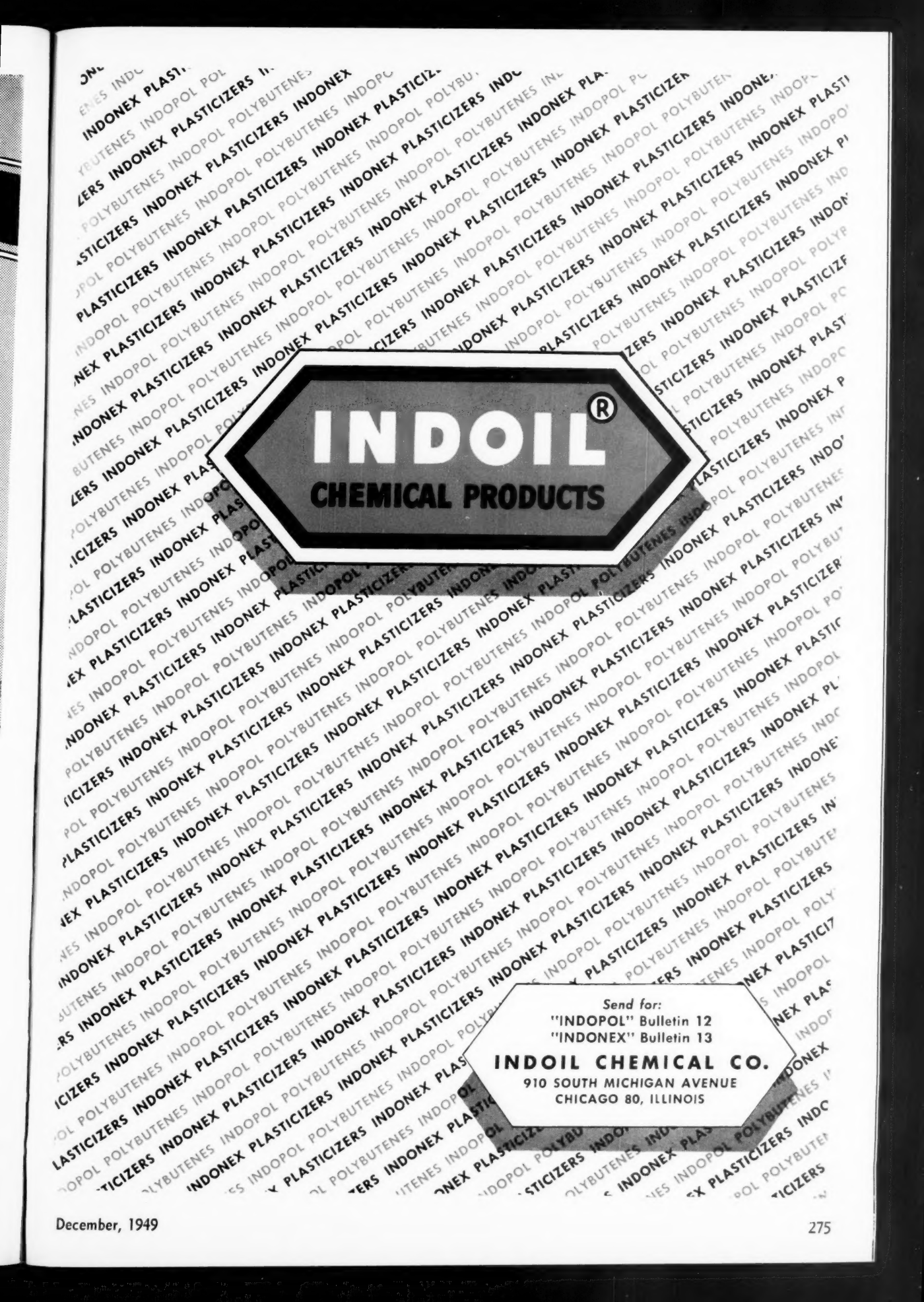


An 8-inch Shaw Strainer.

1006

FRANCIS SHAW & CO. LTD. MANCHESTER 11 ENGLAND

R-138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CHEMICAL PRODUCTS
Send for:
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"INDONEX" Bulletin 13
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CHICAGO 80, ILLINOIS

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BUTYL INNER TUBES
MECHANICAL GOODS
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use—

WHITETEX

• FINE particle size white pigment. Brightness 90-92. GOOD reinforcing. Excellent *processing*.

»» SAMPLES SENT PROMPTLY ON REQUEST. ««

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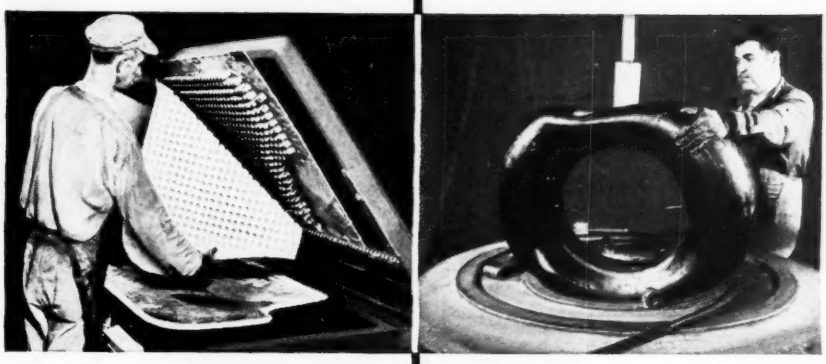

Rubber Lubricants to fill every need

Polyethylene Glycols

"Carbowax" Compounds
Trade-Mark

"Ucon" Lubricants
Trade-Mark

They { *leave little residue....*
are water-soluble....
are less volatile than glycerine....

Polyethylene glycols, CARBOWAX compounds, and UCON lubricants have three outstanding advantages as rubber release agents and lubricants:

1. They offer a wide choice of products to meet particular requirements.
2. They leave a minimum of residue in the molds, resulting in longer operation before shut-down for cleaning purposes.
3. They are water-soluble, permitting easy application and removal.

These lubricants are used to treat tire bags for tire molding and to release many types of molded rubber objects such as hose cured on mandrels, sponge and foam rubber products, shoe soles and heels, extruded products and battery cases. They are also excellent lubricants for rubber shackles and joints and for rubber machining operations. Effective anti-stick agents for piled rubber slabs are formulated with these products. Water insoluble UCON lubricants are also available which are desirable in many applications.

All of these products may be used with or without other materials such as wetting agents, mica, clay, and organic solvents.

For more information about these polyalkylene glycol lubricants write Department M-12 for the booklets, "CARBOWAX Compounds and Polyethylene Glycols" and "UCON Fluids and Lubricants."

"Carbowax" and "Ucon" are registered trade-marks of C.&C.C.C.

CARBIDE and CARBON
CHEMICALS CORPORATION

Unit of Union Carbide and Carbon Corporation

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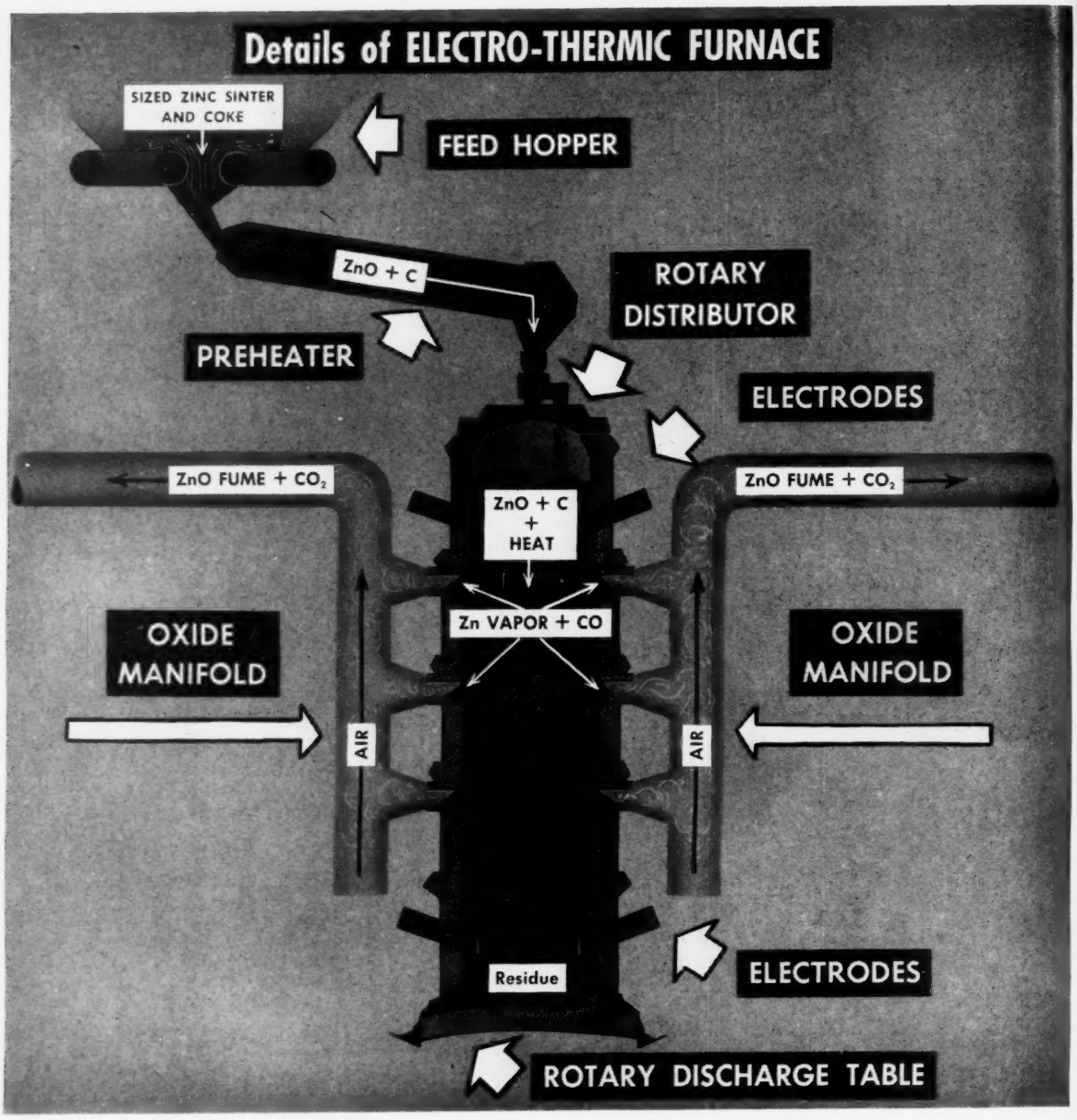
Offices in Principal Cities
In Canada:
Carbide and Carbon Chemicals, Limited, Toronto



ST. JOE Lead-Free ZINC OXIDE

Made by the improved American Process

The St. Joe Electro-Thermic method of smelting zinc ore is a recent improvement of the American Process, and the diagram shown here illustrates the final operation in the production of zinc oxide.

Prior to this operation the mined ore has been concentrated, calcined and sintered to remove impurities, some of which, such as sulfur, cadmium and lead are recovered. Sized zinc sinter and coke are transferred from the feed hopper to the preheater, where they are thoroughly mixed and brought near to smelting temperature, and are thence distributed evenly in the furnace by the rotary feed mechanism, which also excludes air from the furnace interior. The furnace charge is brought to smelting temperature by its action as resistor to a 3-phase electrical current supplied by six carbon electrodes which are inserted in the charge. At this temperature, carbon combines with the oxygen, held by the zinc in the sinter, releasing carbon monoxide and zinc vapor which are forced through tuyeres as a result of a slight pressure created in the furnace. Air is introduced at this point and the zinc vapor and carbon monoxide are oxidized under carefully controlled conditions to zinc oxide fume and carbon dioxide, which are then conducted through the pipe line, together with excess air, to the bag room where the zinc oxide is filtered from the carrying gases, collected and packed for storage.

The direct-from-ore, or American Process, is more economical than the two-step, or French Process. By the latter, metallic zinc is produced first and, by the second step, is converted into zinc oxide. The American Process also makes it possible to produce types of zinc oxide that give superior properties to the product in which it is used as a raw material.

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Plant & Laboratory, Monaca (Josephtown) Pa.

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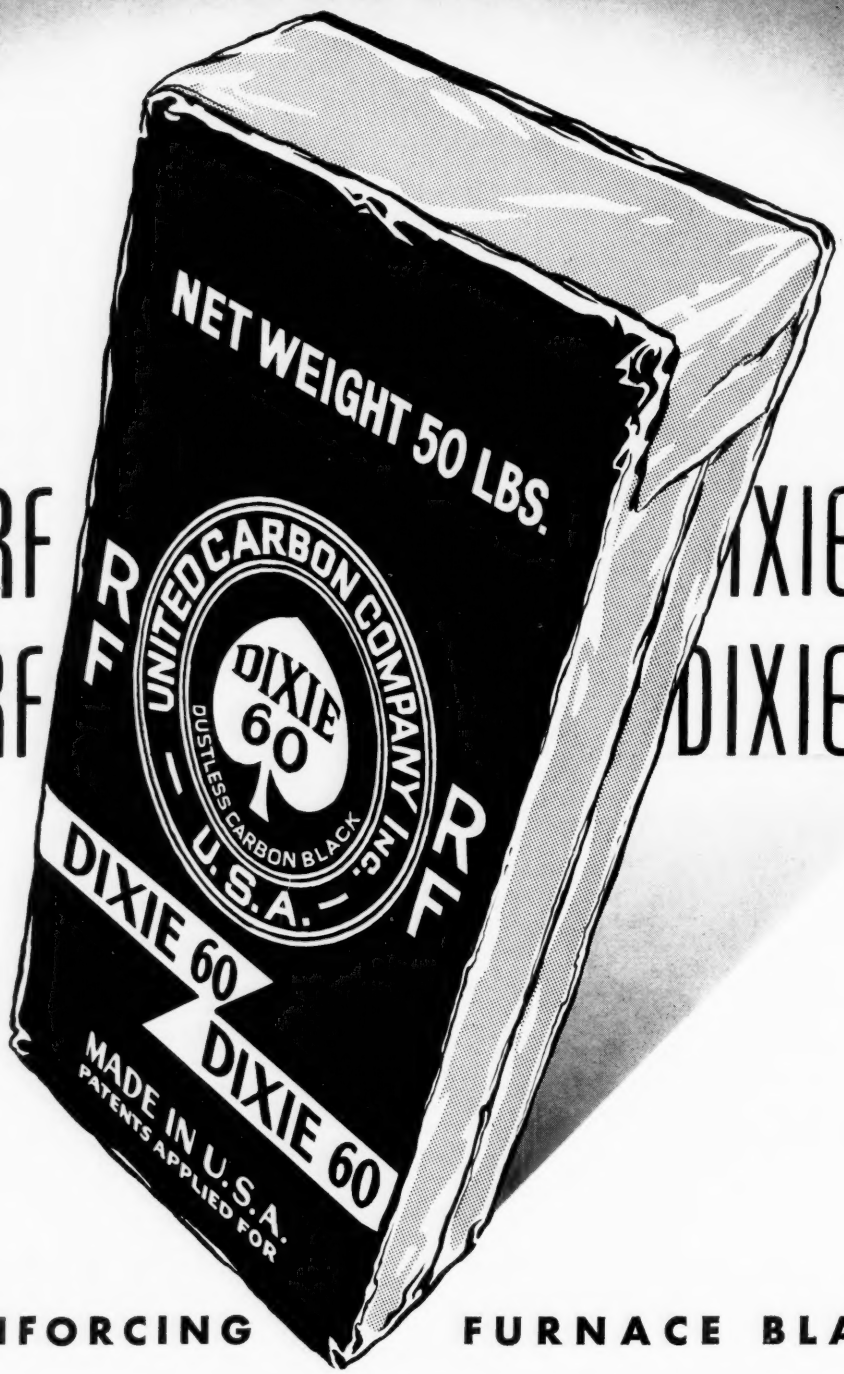
DIXIE 60 RF

DIXIE 60 RF



DIXIE 60

DIXIE 60

REINFORCING FURNACE BLACK

Dixie 60 (an R F black) is an extraordinarily good black because of the way it is made and what it can do. Created from a particular oil and under controlled heat and reactions in our own furnace process, Dixie 60 is fitted for easy and efficient processing, fast extrusion, less nerve, proper smoothness, tight cure, mighty reinforcement, high electrical conductivity and superb resistance to wear and flex crack cut-growth. Standardize on Dixie 60 to give your products the supremacy they deserve.

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CANADA: CANADIAN INDUSTRIES, LIMITED

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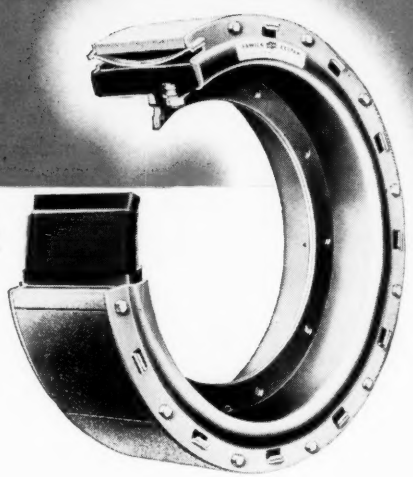
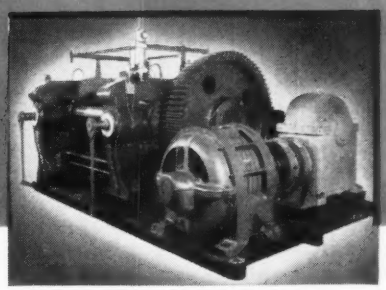
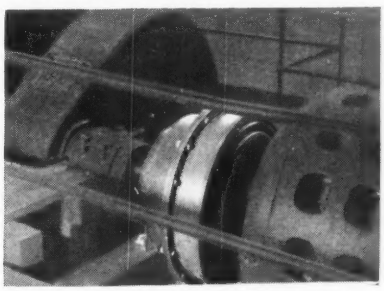
do More Work at Less Cost



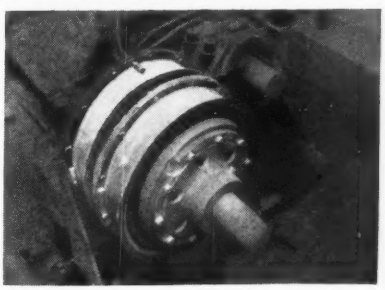
Fawick Air-Ring Clutch or Brake Type E



Fawick Airflex Clutch and Brake on Standard No. 7 Heavy-Duty Warming Mill manufactured by Stewart Bolling & Co., Inc., Cleveland, Ohio.



Fawick Airflex Clutch and Brake on Rubber Mill drive at Rome Cable Co., Rome, N. Y.



Fawick Airflex Clutch and Brake on two Allen Mills at Hartz-Mason, Inc., Watertown, Mass.

Time-wasting clutch adjustment down time is practically eliminated on Fawick-equipped machines. The moving parts of this Fawick Clutch—the rubber-and-fabric pneumatic tube and the friction shoe assemblies—adjust automatically and compensate for wear.

The smooth engagement action of this Fawick Clutch eliminates sudden shock loads which damage machinery. Controlled torque starting can be obtained with a simple modulating air valve. This type Fawick Clutch is ideally suited to continuous slip applications.

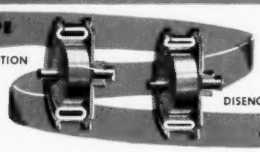
For specific recommendations for your machines, write to our Engineering Department today. Address Dept. IR.

FAWICK Airflex CO., INC.
9919 CLINTON ROAD CLEVELAND 11, OHIO

THERE IS A FAWICK CLUTCH OF PROPER TYPE AND CAPACITY FOR EVERY REQUIREMENT

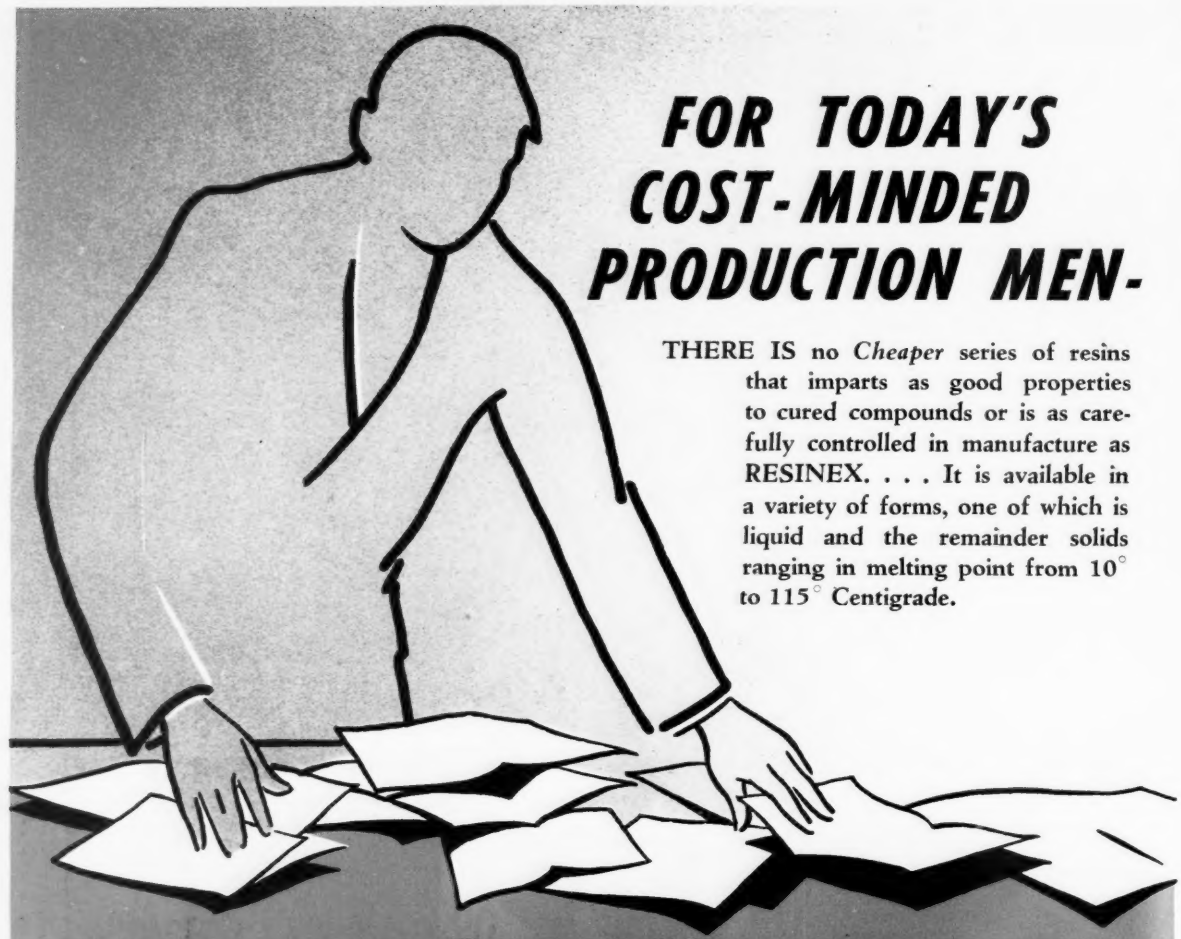
ENGAGED POSITION

Expanding under force of compressed air, the rubber-and-fabric tube smoothly engages the clutch with the precise degree of grip required by the job.



DISENGAGED POSITION

Releasing air through the instant-acting Fawick Quick Release Valve promptly and fully disengages the clutch, lets it ride completely free, without drag, or mechanical contact



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THERE IS no *Cheaper* series of resins that imparts as good properties to cured compounds or is as carefully controlled in manufacture as RESINEX. . . . It is available in a variety of forms, one of which is liquid and the remainder solids ranging in melting point from 10° to 115° Centigrade.

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★ IMPROVED RESISTANCE TO FLEX-CRACKING AND CUT-GROWTH

★ HIGHER TENSILE with BETTER ELONGATION and TEAR PROPERTIES

★ SMOOTHER EXTRUSION

WRITE FOR NEW RESINEX BULLETIN TODAY!

HARWICK STANDARD CHEMICAL CO.

AKRON 8, OHIO

BRANCHES: BOSTON, TRENTON, CHICAGO, LOS ANGELES

New ALBALITH-73 (LITHOPONE)

CUTS COSTS... IMPROVES QUALITY...

of Lithopone-Rubber Compounds

ALBALITH-73

- Mixes more quickly
- Aids tubing, calendering & spreading

—BECAUSE it's coated with fatty acids.

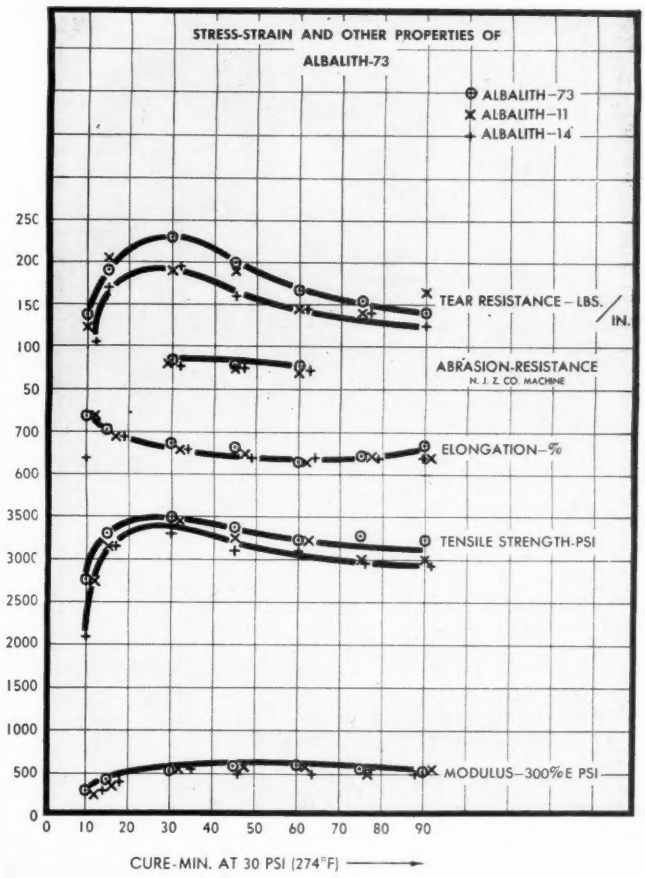
ALBALITH-73

- Provides higher tensiles
- Gives better tear resistance

—BECAUSE its better dispersion produces more interfacial area of contact with the rubber.

See the stress-strain comparison of Albalith-73 and two widely-used lithopones in chart at right.

YOU, too, can obtain improved reinforcement in YOUR lithopone stocks. Just make a direct substitution using Albalith-73. No accelerator-sulfur adjustment is necessary.



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COMPOUND

Smoked Sheet	100
Protox-166	5
Sulfur	3
MBT	1
Agerite Powder	1
Stearic Acid	3
Lithopone	70.4

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THE NEW JERSEY ZINC COMPANY

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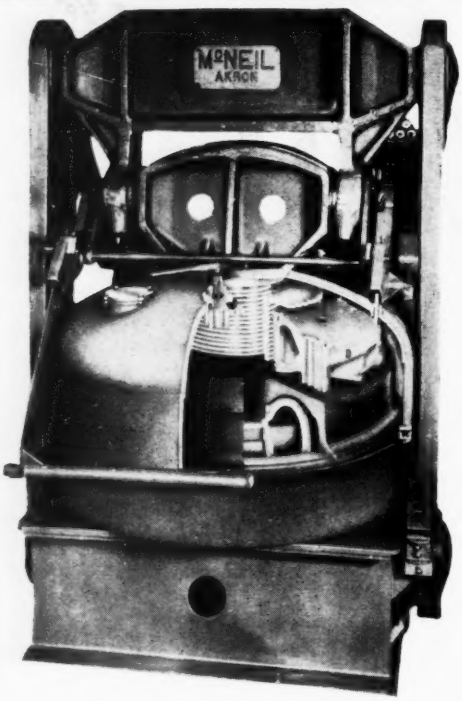
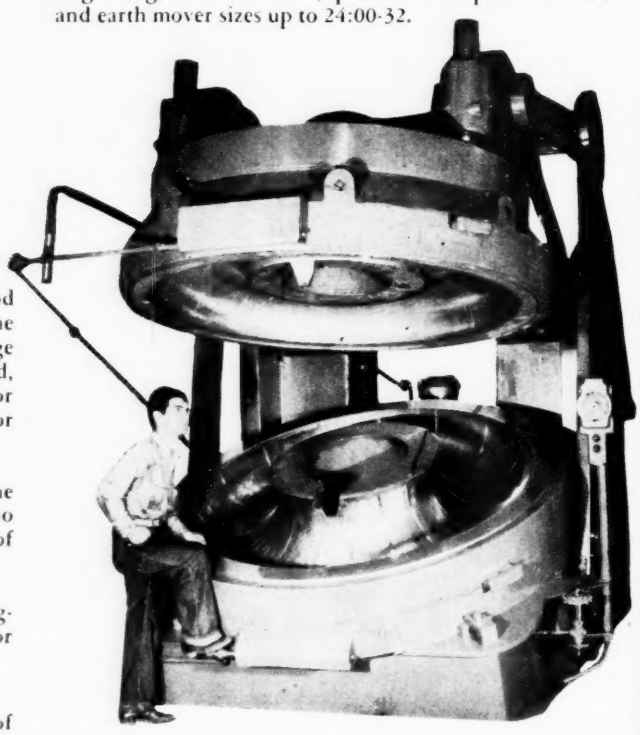


Model 675-65"-18D Single Tire Press

McNEIL

TIRE *and* TUBE CURING PRESSES IN POPULAR SIZES

Model 400 — 75" — 25, shown below, will handle the larger regular truck sizes, plus farm implement sizes and earth mover sizes up to 24:00-32.



Model 400 — 75" — 25 Tube Press

1

Labor and power saving. Our patented method for stripping any size of tire takes most of the work out of the job. One man can operate a large battery of presses. Very little power is required, as our electrically operated unit requires power for only a few seconds during each cycle, to open or close the press.

2

High production, resulting in lower costs due to almost continuous curing. One-half minute to two minutes for changes, depending upon size of tire being cured.

3

Wide range of flexibility and fast mold changing. Simple and rugged design of mechanism for adjustment to suit mold thickness.

4

Better cures, because of open steam method of curing, plus individual temperature and pressure control, plus cooling if desired. All presses are heavy duty type for high internal pressures.

All the experience and engineering skill of the McNEIL organization is at your call to help you increase efficiency and speed while lowering production costs. For tomorrow's production, check with McNEIL today.

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RUBBER WORKING MACHINERY • INDIVIDUAL CURING EQUIPMENT FOR TIRES, TUBES and MECHANICAL GOODS

Have you refigured your delivered pound volume costs since freight rates were increased

CALCENE T RESULTS IN SAVINGS WHEN COMPARED WITH MANY OTHER PIGMENTS

Write for Columbia Pigments Data Sheet No. 49-1. It provides you with information of value in comparing the delivered pound volume costs and performance of Calcene T with various reinforcing pigments. Calcene T also has the advantage of easy dispersibility due to its surface coating and particle size.

With the new emphasis on lowering production costs, the use of Calcene T affords an excellent means of effecting economies. Data and test samples may be obtained on request to Pittsburgh Plate Glass Company, Columbia Chemical Division, Fifth Avenue at Bellefield, Pittsburgh 13, Pa.

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Indispensable TO YOU IN THE RUBBER INDUSTRY—

Gives Your Products

PROTECTION and SALES APPEAL

at Little Cost!

BEACOFINISH—a unique family of coating materials conceived to give your products greater durability and eye appeal. These highly concentrated wax emulsions that can be diluted with up to four parts of water can be used with the utmost safety and economy.

BEACOFINISH is therefore of four-fold importance to you:—

1. ***It Protects*** your products against their natural enemies—air, sunlight, moisture and excessive handling.
2. ***It Improves*** the appearance of your product for its uniform coating stimulates greater consumer interest.
3. ***It's Economical*** because its high dilution potential (without losing efficiency) allows one gallon to cover 15,000 sq. ft.
4. ***It's Safe*** being a wax in water emulsion, it eliminates the fire and health hazards of volatile-solvent based finishes.

BEACOFINISH can be applied by dipping, sponging, spraying or brushing—dries in about 20 minutes—faster if force-dried—to give a hard protective coating of great elasticity.

BEACOFINISH may be ordered in Neutral or Black, in varying degrees of luster from brilliant to dull. It is so concentrated, from one drum you can obtain potentially up to five drums of superior coating for your products.

CONSULT US—WRITE US TODAY

Let us show you how BEACOFINISH can make your products more attractive and saleable—protect them from damage—you from loss—in production and transit!

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PURITY-UNIFORMITY-DEPENDABILITY
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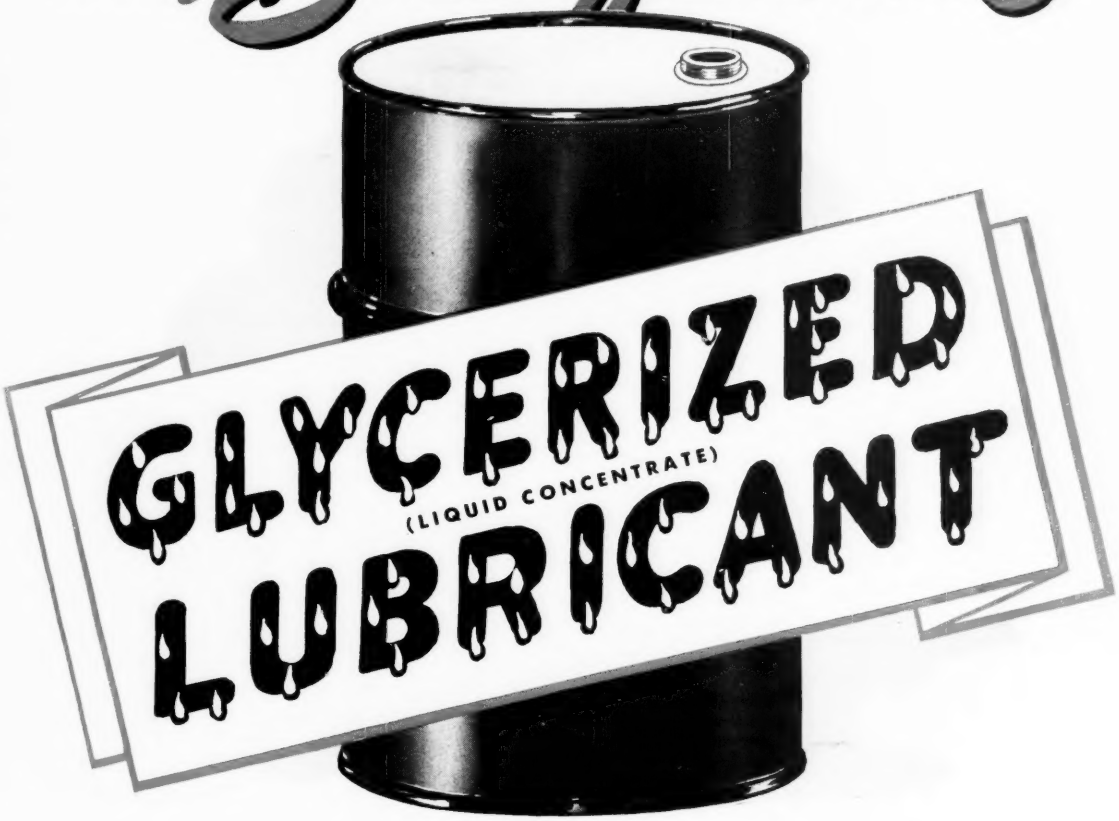

Prevents adhesion of hot rubber slabs when piled . . . banishes dust nuisance by replacing soapstone or talc . . . prevents sticking during cure of extrusions and flat pan coiled tubing . . . excellent release agent for molds, mandrels, air bags, belt drums . . . equally satisfactory for washing and finishing inner tubes; imparts satiny finish . . . greatly aids in the processing of insulated wire and cable. The Production Departments and Laboratories of many rubber manufacturers, through years of using GLYCERIZED, give ample proof of its outstanding qualities as a lubricant for natural, synthetic and reclaimed stocks.

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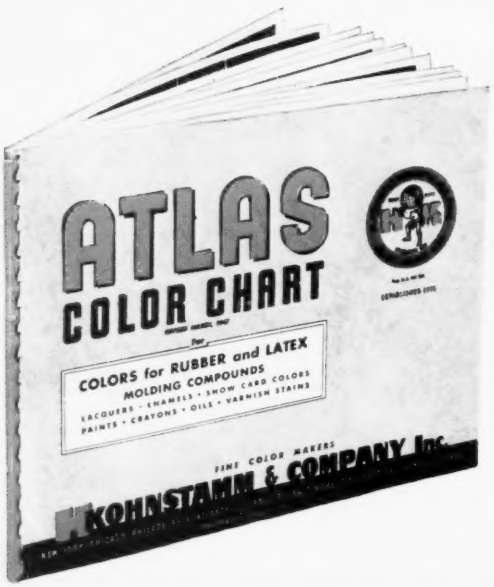
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A complete line of ORGANIC PIGMENTS for RUBBER, LATEX and RUBBER REPLACEMENTS. All colors are checked for performance under PRESS CURE—OPEN STEAM—ACID CURE—SOAP WASH—and resistance to HYDROCHLORIC ACID.

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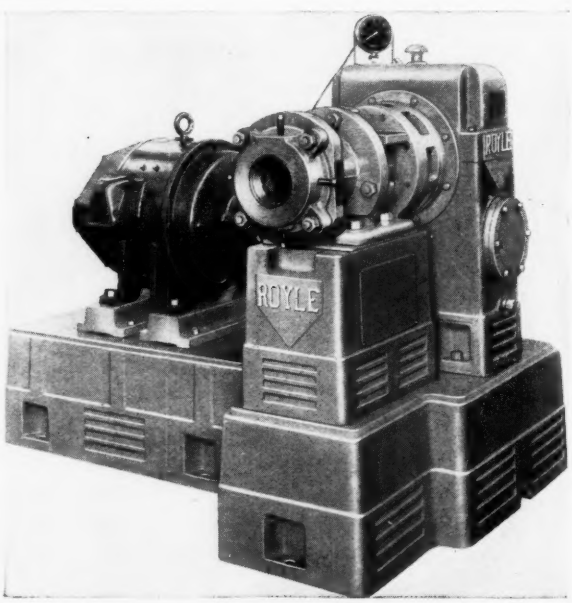
IN these days of rapidly changing developments owners of Royle extruding machines are in the advantageous position of being able to adapt their extruders to either rubber or plastics production. If you are faced with the problem of extruding rubber and plastics the versatility of ROYLE extruders is of paramount importance to you. Whether you require a light or heavy production extruder features have been incorporated to assure maximum results. The change-over is quickly and simply accomplished.

Send for your copy of Bulletin No. 448. It describes these features and how they may be applied to older type extruders.



ROYLE # 2 Extruding Machine. Non-extended cylinder, plain tubing head.

JOHN ROYLE & SONS ROYLE PATERSON N. J.

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Self-Activating Primary Accelerator

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2-BENZOTHIAZYL-N-N-DIETHYL THIOCARBAMYL SULFIDE

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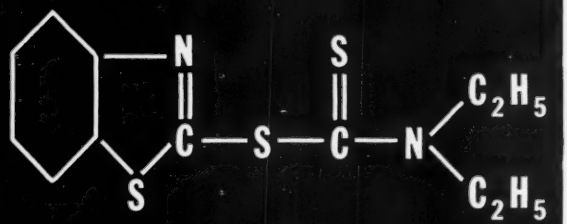

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Exhibits high activity; good delayed action; good processing properties.

Is non-discoloring; practically dust-free.

Requires no special handling precautions.

Has excellent storage stability.

Samples and compounding data available on request.

For further information, write to Dept. P.

PROPERTIES:

Color . . . light yellow to tan

Odor . . . . . characteristic

Melting Point . . 71°C. min.

Volatiles . . . . 0.5% max.

Specific Gravity 1.27

Mol. Wt. (calcd) . . . 282.4

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ACCELERATORS • VULCANIZING AGENTS • PLASTICIZERS
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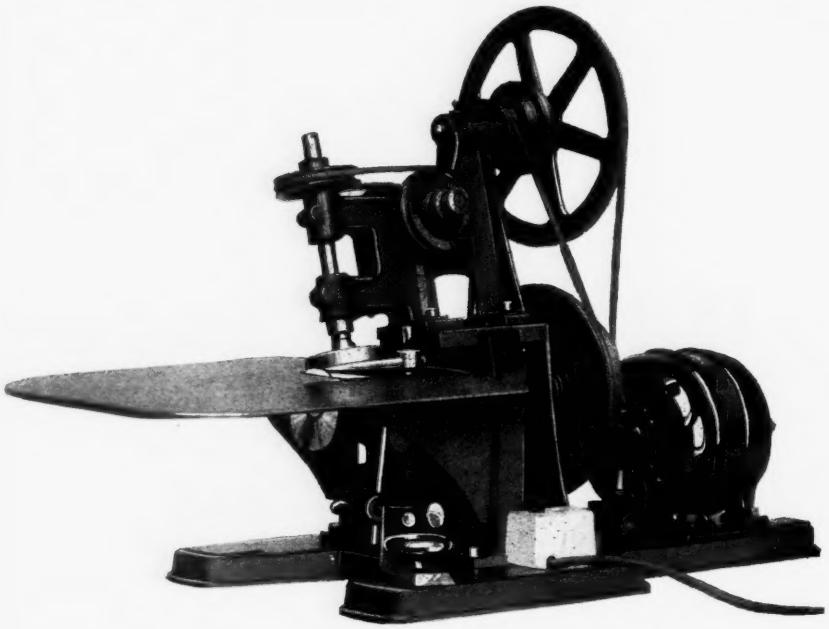
T. W. MORRIS TRIMMING MACHINES



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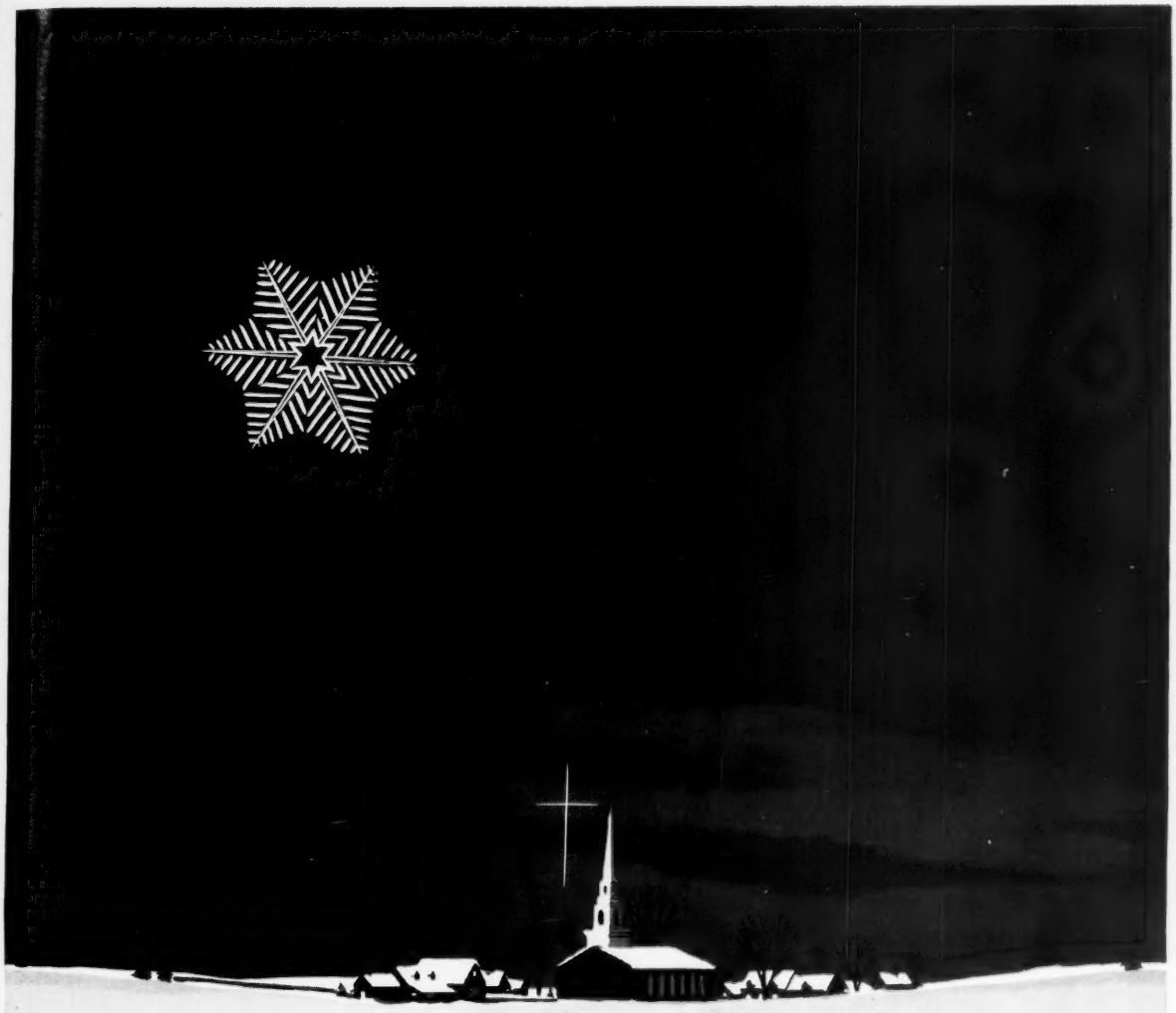

Season's Greetings

and Best Wishes for the

NEW YEAR

ADAMSON UNITED COMPANY

AKRON 4, OHIO

NRM

COST CUTTING EQUIPMENT

for the Production of Tires and Tubes

- **MODEL 49 TIRE BUILDING MACHINE** sequence timed for high output and balanced uniform product
- **AUTOMATIC BIAS CUTTER** fast sequence cutting of various predetermined ply widths
- **PRECISION TREAD CUTTER** accuracy within 1/16" to eliminate recutting
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- **TIRE SHAPER & BAGGER** Vacuum and pressure types for all sizes
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- **TIRE AND TUBE MOLDS**

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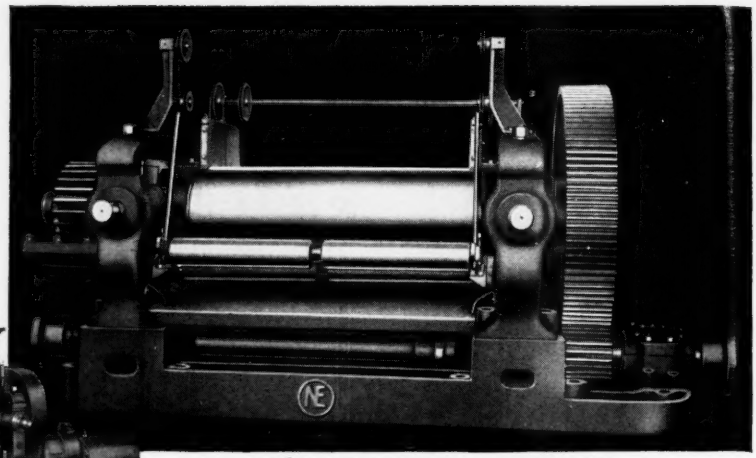

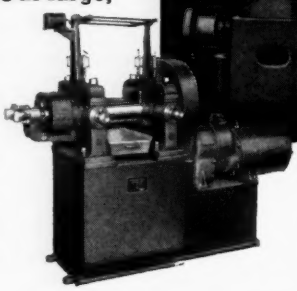

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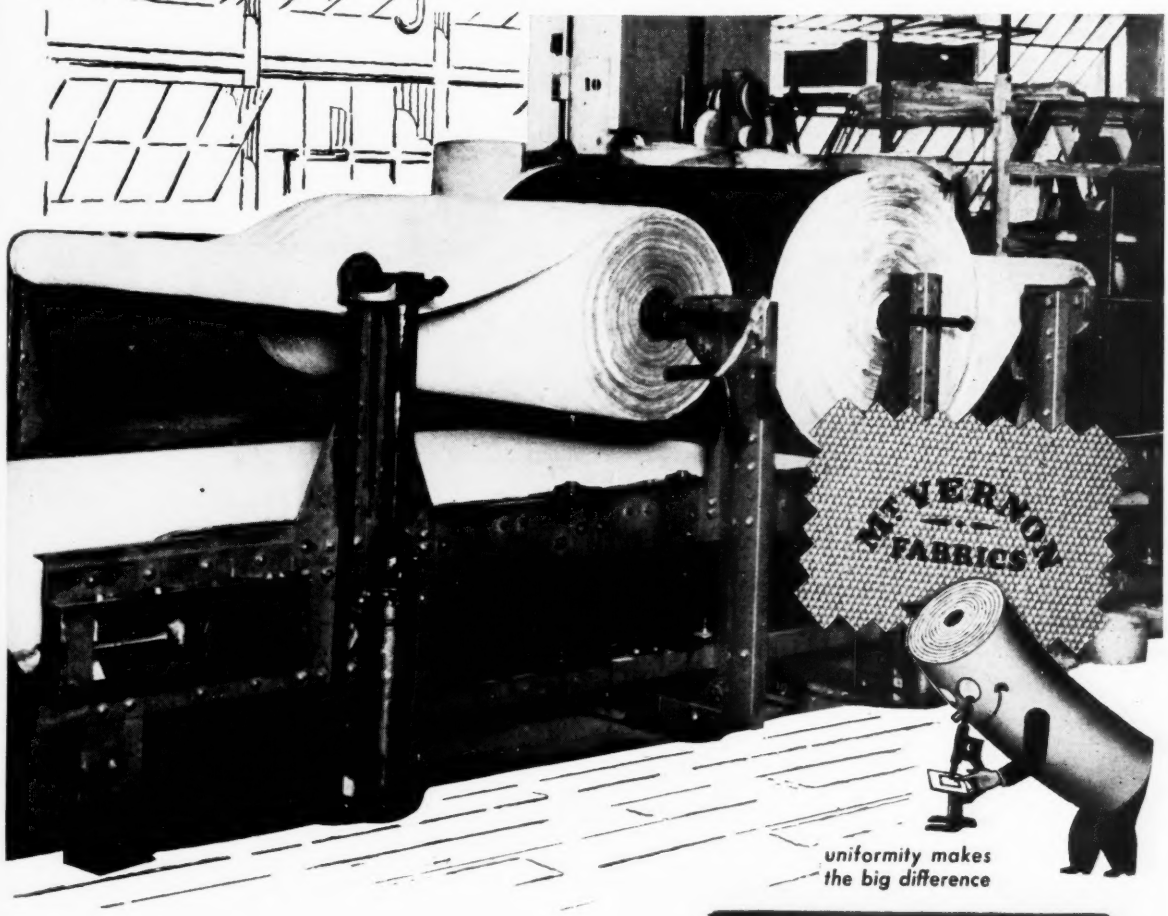

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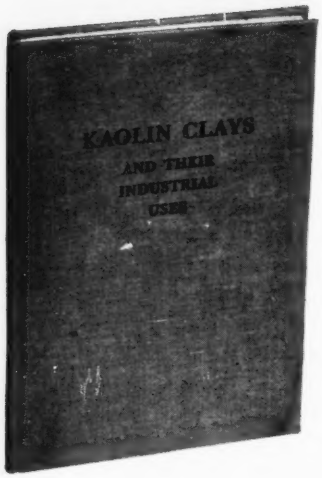

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Tensile Properties of Natural and Synthetic Rubbers at Elevated and Subnormal Temperatures[1]

B. S. T. T. Boonstra[2]

IN THE literature of rubber chemistry and technology it has become customary to call a rubber heat resistant when its physical properties, measured at room temperature, are not substantially reduced after the rubber has been exposed to elevated temperatures, for example, 100 or 120° C. (212 or 248° F.), for certain periods of time and then cooled to room temperature and again tested. For the purpose of this paper the term "heat aging" will be used to define this type of testing. With this type of test, synthetic rubbers such as Butyl and neoprene give results superior to those obtained with natural rubber.

Under actual service conditions at elevated temperatures, however, there is frequently a factor of far greater importance than the heat aging as defined above. In order to evaluate the serviceability at higher than normal temperatures of a rubber product such as a tire it is desirable to know the physical properties of the rubber at those temperatures. These properties are more properly classified as the "high temperature strength" of the rubber. It is obvious therefore that these high-temperature strength properties must be determined at the actual temperatures to which the product will be exposed in service.

To judge a material on the basis of its strength, not only the usual tensile strength, but also the elongation at rupture must be considered. In tensile product (tensile product $= \frac{\text{tensile strength} \times \text{elongation} + 100}{100}$) both properties are united in one value, and the actual strength at the moment of rupture is indicated.

In this paper we will, for practical reasons, first consider tensile strength and elongation values separately and then discuss the relation of actual strength and temperature.

Effect of Temperature on Tensile Strength

The effect of temperature on tensile strength has been reported by various authors.[3-6] The first two investigations concern only natural rubber compounds, but the third also includes synthetic rubbers at temperatures between 25 and 80° C. (77 and 175° F.) In this paper tests will be described on several natural and synthetic rubber compounds over a range of temperatures from —10 to +120° C. (14 to 248° F.). Four natural rubber compounds were tested, i.e., a normal sulfur vulcanizate, a special low sulfur vulcanizate, a compound vulcanized with tetramethyl thiuram disulfide alone, and a carbon black compound. The synthetic rubbers were tested in pure gum and carbon black compounds. (See Table 1.)

The tests were carried out by mounting a jacketed glass tube, through which a heating or cooling liquid circulates, on an ordinary Schopper testing machine. The sample was therefore not in contact with the heating or cooling liquid, but only with indirectly heated or cooled air. The rate of separation of the jaws of the Schopper machine was 30 centimeters per minute.

Results shown in Figure 1 for pure gum vulcanizates indicate that for neoprene and Butyl rubbers, tensile strength decreases very rapidly in the neighborhood of 25° C. The temperature coefficient of tensile strength for these rubbers is so high at this temperature that it may be the cause of serious errors in testing if the temperature is not carefully controlled. For nitrile type rubbers (Hycar and Perbunan) this rapid decrease in tensile strength occurs between —10 and +10° C. (+14 and 50° F.). It appears that even at only 50° C. (120° F.) the tensile strength of these rubbers is very low; the same holds for GR-S; this latter has low tensile strength at any temperature measured above 0° C. The greatest change in tensile strength between —10 and +70° C. (158° F.) was registered for neoprene, which went from 500 kg./cm.² (7,100 p.s.i.) to only 30 kgs./cm.²

---

1 Communication No. 94 (1949), Rubber Stichting, Delft, Holland.
2 Technical laboratory, Rubber Stichting.
3 A. Van Rossem and H. van der Meyden, *J. Soc. Chem. Ind.*, 45, 67 T (1926).
4 A. A. Sommerville and W. F. Russell, *Ind. Eng. Chem.*, 25, 1096 (1933).
5 A. J. Wildschut, "Technological and Physical Investigations on Natural and Synthetic Rubbers," Elsevier, New York - Amsterdam (1946).
6 J. D. Morron, R. C. Knapp, E. P. Linhorst, P. Viohl, India RUBBER WORLD, Aug., 1944, p. 521.

TABLE 1. COMPOUNDING CHART

	Natural Rubber				GR-S		Neoprene GNA		Butyl		Perbunan		Hycar OR-15		41° F. GR-S (Ultipara)
	A*	B	C†	D											
Polymer	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Zinc oxide	10	5	5	10	5	5	5	5	3	3	5	15	5	5	3
Antioxidant	1	...	1.5	1.5	1	1	2	2	...	...	1	2	...	...	1.2
Altax	...	...	...	...	...	...	...	...	...	...	...	...	1.25	1.25	...
Captax	1	...	0.8	0.8	...	...	...	...	0.5	0.5	...	...	...	...	...
DPG	...	...	0.5	0.5	...	...	...	...	...	...	...	...	...	...	...
Vulkacit AZ	...	...	...	...	...	...	...	...	...	...	1.8	1.8	...	...	...
Tuads	0.2	3	...	...	0.2	0.2	...	...	1.0	1.0	...	...	...	...	...
EPC Carbon Black	...	...	...	44	...	50	...	30	...	50	...	57	...	50	50
Dibutyl phthalate	...	...	...	...	...	...	...	...	...	...	...	...	...	20	...
Tricresyl phosphate	...	...	...	...	...	...	...	...	...	...	...	30	...	...	...
Stearine	1	1	1	2	1.5	1.5	0.5	0.5	1	1	2	2	1.5	1.5	...
Other softeners	...	...	...	10*	...	8	...	...	...	...	...	10	...	...	4
Sulfur	0.5	...	1.75	2	2	2	...	...	2	2	1.5	1.5	1.25	1.50	2
Extra light magnesia	...	...	...	...	...	...	4	4	...	...	...	...	...	...	...
Santocure	...	...	...	...	1.2	1.2	...	...	...	...	...	...	...	...	1.65
Vulcanization in minutes	30	30	20	20	30	60	15	15	40	60	25	25	30	45	40
Temperature °C.	134	142	142	142	142	142	152	152	152	152	142	142	152	152	142
°F.	274	287	287	287	287	287	306	306	306	306	287	287	306	036	287

*Low sulfur compound.
†Normal sulfur compound.
*A natural rubber vulcanizate without softener was also prepared.

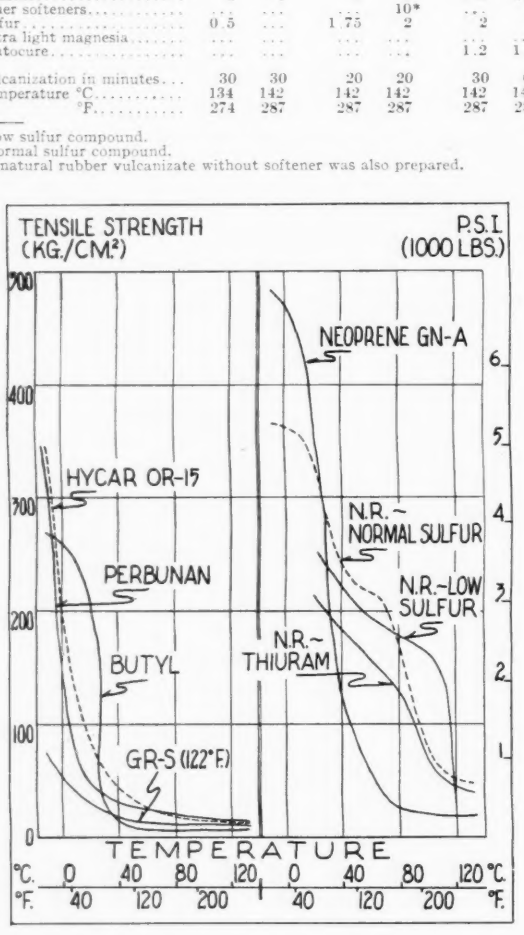


Fig. 1. Tensile Strength as a Function of Temperature for Pure Gum Vulcanizates

(430 p.s.i.) in this range. All the other synthetic rubbers gave even lower tensile strength figures at 70° C. than did neoprene.

Both the high and low sulfur vulcanizates of natural rubber at 70° C. still possess a tensile strength of 180-200 kgs./cm.² (2,500-2,900 p.s.i.) and are in this respect far superior to the synthetic rubbers. The normal sulfur compounds and the thiuram compound lose their tensile strength more rapidly at temperatures above 70° C. than does the special low sulfur compound which does not show much loss of tensile strength up to 100° C. The natural rubber thiuram vulcanizate, although decidedly superior in heat aging to the sulfur vulcanizates, has a somewhat lower tensile strength over almost the whole range of temperature tested. This non-sulfur vulcanizate still possesses a high temperature

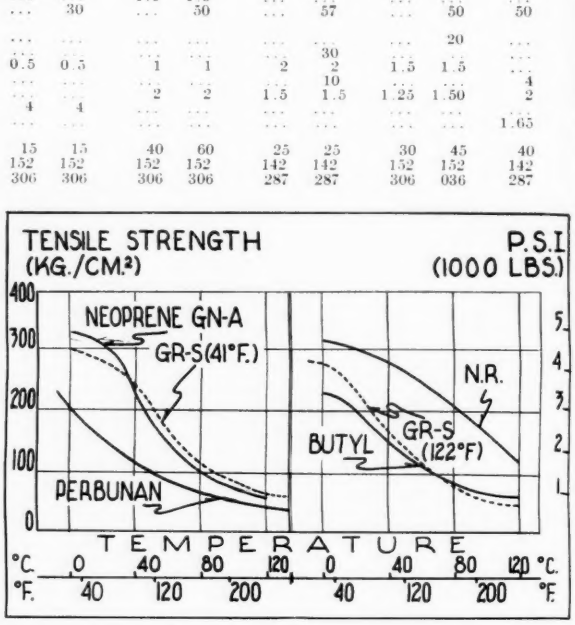


Fig. 2. Tensile Strength as a Function of Temperature for Carbon Black Vulcanizates

tensile strength, however, of 150 kg./cm.² (2,100 p.s.i.) at 70° C. It is evident that the temperature coefficient of tensile strength of natural rubber compounds is dependent on the type of formulation used.

Carbon Black Compounds

Compounding with carbon black influences the effect of temperature on tensile strength, as is demonstrated in Figure 2. Experiments have shown that carbon black in the compound tends to maintain tensile strength at higher than normal temperatures; whereas increasing amounts of softeners or plasticizers have the opposite effect. The neoprene and Butyl rubber carbon black compounds in Figure 2 do not contain softeners and a less pronounced change of tensile strength with temperature, when compared with the pure gum vulcanizates in Figure 1, will be noted.

The other compounds in Figure 2, however, do contain softeners; about 10 parts/100 for natural rubber and GR-S, and 40 parts/100 for Perbunan. For natural rubber the curve is somewhat less steep, but is practically the same as for the normal sulfur pure gum compound. For GR-S the curve has changed substantially, since carbon black is necessary to obtain tensile strength values of practical interest with this synthetic rubber. The general trend of the GR-S curve is about the same as the one for natural rubber, but above 40° C. (105° F.) the level is about half that of natural rubber.

"Cold rubber" (GR-S polymerized at 41° F.) does not exhibit improved tensile strength at elevated temperatures when compared with regular GR-S; although the

tensile strength is somewhat higher at room temperature, this difference almost disappears at 120° C. (248° F.).

The characteristic high decrease in tensile strength, when the neoprene is subjected to elevated temperatures, is much less when neoprene is compounded with carbon black. The tensile strength of Butyl rubber at higher than room temperature is also improved by the addition of carbon black. Perbunan occupies about the same relative position as GR-S. Compounding Perbunan with carbon black improves its tensile strength at elevated temperatures, but at these temperatures it is still not much more than half so strong as natural rubber.

Effect of Temperature on Elongation

The effect of temperature on elongation at break for the various rubbers is shown in Figure 3. Elongations at break for pure gum compounds are given in Figure 3A and for the carbon black compounds in Figure 3B.

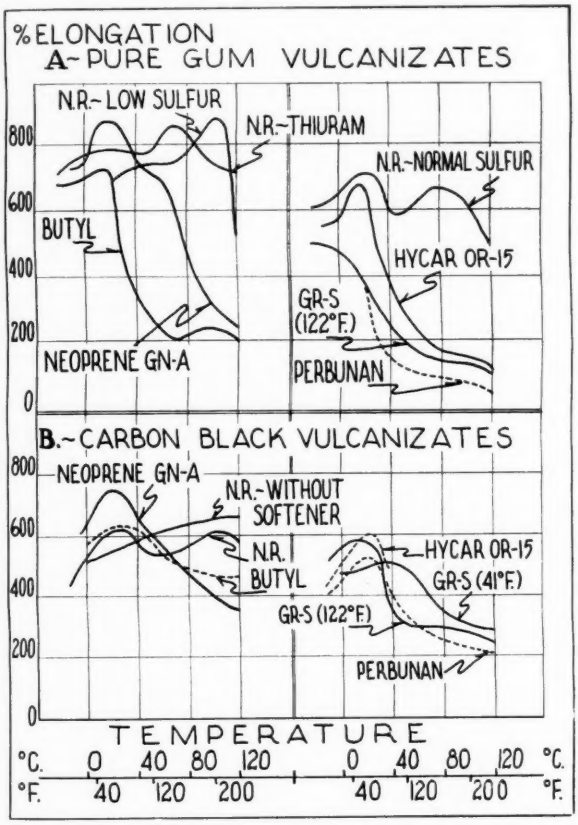


Fig. 3. Elongation at Break as a Function of Temperature: A—Pure Gum Vulcanizates; B—Carbon Black Vulcanizates

All the synthetic rubber compounds exhibits a rapid decrease in elongation at break with temperature; the curves are similar to those for high-temperature tensile strength. At 100° C. all the pure gum synthetic rubber compounds have elongation values below 250%, except for the neoprene, which has a value of about 300% at 100° C. Natural rubber, however, varies little in elongation at break up to 100° C. At this temperature all three of the natural rubber compounds tested still showed an elongation at break of over 600%, and for the thiuram compound even at 120° C. the values were not much lower than those at 100° C. The latter compound showed the least change of elongation with higher temperatures.

The values of elongation at break at various temperatures for the carbon black compounds are quite different from those for the pure gum compounds. The natural rubber compounds again show much less decrease in elongation with temperature, although the change of elongation with temperature for the other rubbers is less pronounced than for the corresponding pure gum compounds.

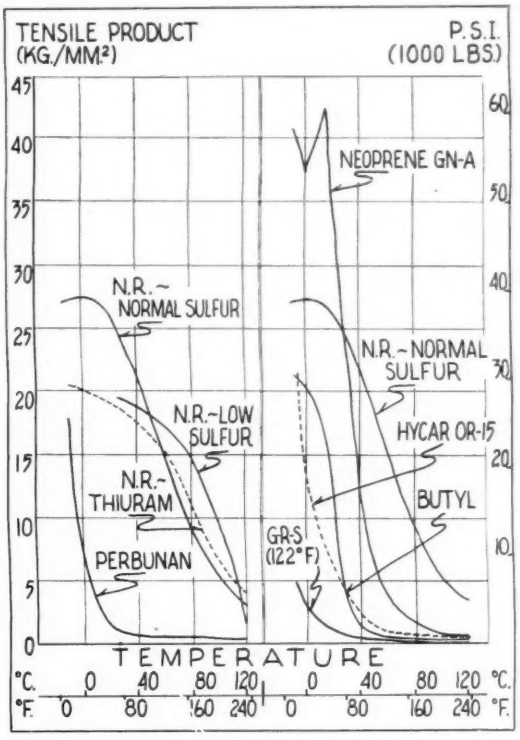


Fig. 4. Tensile Product as a Function of Temperature for Pure Gum Vulcanizates

The importance of preservation of elongation at elevated temperatures is not so apparent in itself, but lies with the bearing of good elongation values on high temperature strength properties when calculated as tensile product. Here the greater elongation values for natural rubber at high temperatures would provide higher tensile product values than for the synthetic rubbers even in any instances where the tensile strength of the synthetic rubber was greater than that of the natural rubber.

Effect of Temperature on Tensile Product

The relation between tensile product and temperature is shown in Figure 4 for different pure gum vulcanizates. It is obvious that the three natural rubber vulcanizates do not differ much above 40° C.; at lower temperatures the normal sulfur compound exhibits the higher tensile product. The vulcanizates of GR-S and Perbunan show very low values at normal and elevated temperatures, but at subzero temperatures, Perbunan, for example, shows a rapid increase in the tensile product value as the brittle point of the polymer is approached. This effect is still more evident with Hycar OR-15 and in the Butyl and neoprene polymers which have a more regular molecular configuration.

With neoprene the increase of the tensile product value with decreasing temperature is very rapid and reaches the record value of 42.5 kgs./mm.² (60,000 p.s.i.) well

above room temperature. In fact all of the synthetic pure gum rubber compounds are very much inferior to natural rubber in their tensile product well above room temperature.

Though it has not yet been possible in this series of experiments to make tests below —20° C. (—4° F.), we may assume that the tensile product decreases again at still lower temperatures. For the normal sulfur compound the work of Wildschut[5] at —253° C. (—460° F.) supplies proof of this trend. At this very low temperature the tensile product for this natural rubber compound is only 8 kgs. mm.^{2} (11,000 p.s.i.); whereas it amounts to 27 kgs. mm.^{2} (38,500 p.s.i.) at room temperature. When the rubber was prestretched at room temperature before testing, the tensile product at —253° C. rose to very high values. This result can be explained by assuming that at low temperatures the movement of the chain segments of the rubber molecule becomes too slow in relation to the speed of stretching during the test, and efficient orientation of the chain segments, by which the secondary forces are enabled to exercise their strengthening influence, is hampered, and this hampering results in lower tensile product values at the low temperatures.

A certain degree of mobility of the chain segments of a polymer is necessary for the development of maximum strength; at temperatures much higher than room temperature, however, the thermal movements of these chain segments are so vigorous that they destroy the structural order created by orientation. Only in the case of the outstanding regularity of the structure, as found in natural rubber, is orientation and even crystallization maintained at temperatures up to 100° C.

Carbon Black Compounds

For the carbon black vulcanizates shown in Figure 5 similar considerations are valid, but the effects are somewhat obscured by the grappling action of the carbon black particles. At the lower temperatures the binding forces due to the carbon black mean decreased mobility of the chain segments of the polymers and the maximum tensile product, and the point at which the tensile product decreases with increasing temperature is at a higher temperature for the several rubbers than it was with the pure gum compounds. The effect of carbon black is to shift the maximum tensile product values to higher temperatures; the carbon black does not properly increase the maximum strength of the vulcanizates.

This effect of the addition of carbon black to the compounds on tensile product is most noticeable for Hycar and Perbunan, obvious for GR-S, and not so noticeable with Butyl, neoprene, and natural rubber. All of these three latter polymers crystallize on stretching at room temperature, and it is likely that the crystallites play a much more important part in the ultimate strength of the polymer than do carbon black particles. In accordance with this conclusion, the graphs illustrate the well-known fact that carbon black does not properly reinforce natural, neoprene, or Butyl rubbers. In these cases the strength of the carbon black compounds is decidedly lower than that of the pure gum compounds, as can be seen from a comparison of Figures 4 and 5.

It is also probable that carbon black does not actually increase the strength of the non-crystallizing polymers; the true effect is really that of increasing the temperature at which maximum tensile product is exhibited to the neighborhood of room temperature. For example, Hycar OR-15 pure gum vulcanizate with a tensile product of 21 kgs./mm.^{2} (about 30,000 p.s.i.) at —10° C. has not yet attained its maximum value; whereas the carbon black vulcanizate exhibits its maximum tensile product of 13 kgs./mm.^{2} (19,000 p.s.i.) at about +10° C. With increases in temperature above room temperature, however, none of the synthetic rubber vulcanizates has a strength comparable to that of natural rubber.

The decided superiority of vulcanizates of natural rubber over those of synthetic rubbers in strength values is considered to be due to the regularity of the chain structure of natural rubber which very easily forms crystallites. The crystal structure embedded in a matrix of homogeneously stretched amorphous material, persistent at very high temperatures and rapidly disappearing with diminishing strain, is responsible for the outstanding physical properties of natural rubber vulcanizates.

The use of carbon black for those rubbers which are lacking in ability to crystallize, though beneficial for several other properties, is merely providing a substitute for the crystallites in natural rubber, which, as far as strength properties are concerned, is still the best material.

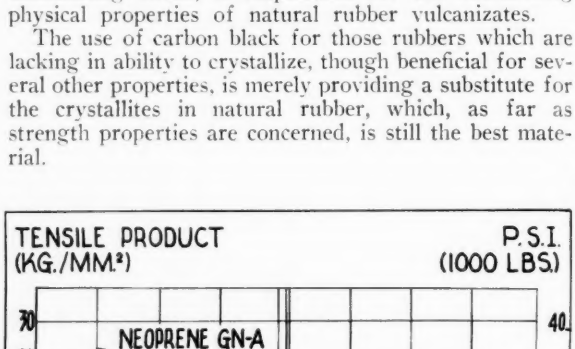


Fig. 5. Tensile Product as a Function of Temperature for Carbon Black Vulcanizates

Summary and Conclusions

It is necessary to determine the physical properties of rubbers at relatively high temperatures when products made from them are to be used at such temperatures in actual service. The term "heat aging" is used when the vulcanizate is tested at room temperature, exposed to elevated temperatures for given periods of time, and then tested again at room temperature. The term "high temperature strength" is proposed for values obtained when the vulcanizates are tested at the actual higher service temperatures.

Effective comparison of natural and synthetic rubbers is best obtained by determining tensile product values which are the result of the combining of tensile strength and elongation values. In the evaluating of vulcanizates of tire compounds of various rubbers, another factor must be taken into account. Synthetic rubber tires develop more heat in service than do natural rubber tires, and the former are therefore generally operating at higher temperatures than the latter. Synthetic rubber tires therefore require a greater "high temperature strength" than natural rubber tires, but, as has been shown, the synthetic rubbers actually have a lower "high temperature strength."

The part played by carbon black with respect to the tensile properties of some synthetic rubbers is considered

(Continued on page 313)

Corrigenda:

WE ARE indebted to Mr. R. G. Newton of the British Rubber Producers' Research Association, for pointing out to us an error in the treatment of the data of Table 4 of the article entitled as above which appeared in the July, 1949, issue of India RUBBER WORLD. The formula used in computing the value of "t" for this table was intended to establish whether the mean difference between the tensile values obtained with the dies 4 and 5 was significantly different from zero. It appears, however, that the formula used is sensitive to the lack of randomness which is introduced when the individual test values are listed in descending order and differences taken between values of corresponding rank in each column.[2] The effect of this method of tabulation is to increase the value of "t" greatly over the true value; hence it tends to ascribe a significance to a difference which might, in fact, not be statistically significant.

It would be more satisfactory instead to test whether or not the mean of one column of tensile values is significantly different from the mean of the other column. Such a procedure, while more laborious, does not require the taking of differences between columns and furthermore may be used conveniently to compare columns of unequal length.[3] This latter procedure was, in fact, used in the construction of Table 2 from the data of Table 1. The differences between tensile values arranged in descending order in Table 1 were used for the purpose of illustration only, and the error under discussion therefore does not apply to Tables 1 and 2.

In reexamining the data of this article, numerical errors in some of the values listed in Table 4 became apparent. Accordingly the corrected table is reproduced below. Upon recomputing these data the averages became slightly higher (3035 p.s.i. for die 4 and 2883 p.s.i. for die 5), the difference between them increased (to 5%) and the value of "t" dropped (to 2.09); this latter drop was occasioned by the use of the appropriate formula, which outweighed the small increase in differences resulting from the corrections in individual figures.

The Effect of Die Surface Irregularities upon the Results of the Tensile Test for Vulcanized Rubber

C. H. Klute[1]

These corrections in general do not change the conclusions as stated in the article, except that now, while the variability between dies 4 and 5 is somewhat greater than previously supposed, the value of "t" obtained is precisely at the 5% level of significance, so that on the basis of the data presented here one might consider the difference barely significant. If comparisons were made on the basis of four specimens instead of eleven per set, such differences could be expected to be well below the level of significance.

TABLE 4. COMPARISON OF TENSILE TEST DATA OBTAINED USING A DIE WITH INTERIOR SURFACES HONED AND USING A TENSILE DIE WITH SPECIALLY TAPPED SURFACES (CORRECTED)

Die 4-Honed Cutting Edges	Die 5-Tapped Cutting Edges
P.S.I.	P.S.I.
3409	3125
3285	3084
3140	3024
3037	2923
3016	2883
3016	2843
3016	2822
2996	2802
2954	2762
2768	2742
2748	2701
avg. 3035	2883

$$\text{STANDARD DEVIATION } \sigma = \frac{\sqrt{\Sigma(X')^2 - \frac{(\Sigma X')^2}{n_2} + \Sigma(X^2) - \frac{(\Sigma X)^2}{n_1}}}{\sqrt{n_1 + n_2 - 2}}$$

$$t = \frac{\bar{X} - \bar{X}'}{\sigma} \cdot \sqrt{\frac{n_1 \cdot n_2}{n_1 + n_2}} = 2.09$$

A Note on a Fallacious Method of Comparing Experimental Results

R. G. Newton[4]

C. H. KLUTE's interesting article, on the effect of sharpness of dumbbell cutters, published in India RUBBER WORLD for July, 1949, contains a fallacious method of interpreting his results. As it is by no means obvious that this method is fallacious, and as even the distinguished statistician Galton used the same incorrect method in 1876 when analyzing some data provided by Charles Darwin, I am glad to have the opportunity of helping him to clarify the position by adding a note on the reason for the fallacy.

The incorrect procedure was to examine the data by taking the differences between pairs of results *after* having arranged each set in *descending order*; this will give a biased result, making the difference appear more significant than it really is. Let me illustrate this by a short story about testing. An investigator wanted to determine the difference in hardness between two kinds of rubber (A and B); so he sent a piece of each to friends of his in five different laboratories who were in a position to carry out tests. The results came back in a random order, and he wrote them down as shown in Table 1.

TABLE 1. THE RESULTS IN RANDOM ORDER

A	B	A–B
34	35	−1
35	32	3
36	30	6
39	30	9
32	37	−5
Mean difference		2.4
Standard error of mean		2.5

TABLE 2. THE RESULTS IN SERIAL ORDER

A	B	A–B
39	37	2
36	35	1
35	32	3
34	30	4
32	30	2
		2.4
		0.51

TABLE 3. THE RESULTS ARRANGED IN LABORATORIES

Lab.	A	B	A–B
I	34	30	4
II	35	32	3
III	36	35	1
IV	39	37	2
V	32	30	2
			2.4
			0.51

[1] Shell Development Co., Emeryville, Calif.
[2] cf. R. G. Newton: *India Rubber J.*, May 15, 22, and 29, 1948. This statement may be deduced from sections 8 and 9 of this paper.
[3] cf. K. A. Brownlee, "Industrial Experimentation," p. 30. Chemical Publishing Co., Inc., Brooklyn, 1947.
[4] The British Rubber Producers Research Assoc., Welwyn Garden City, Herts, England.

I shall assume that my readers understand how to calculate and use the standard error of the mean difference, which is shown at the foot of the table, and they will therefore realize that his mean difference of 2.4 could not be claimed as significantly different from zero because its standard error was 2.5. (This would be the correct procedure for judging the significance of the 2.4 in the absence of further information about any additional sources of variation in the experiment.) He then hit on the idea of arranging the values in descending order, as shown in Table 2; this time his mean difference of 2.4 (naturally it *must* be the same value) had a standard error of 0.51, and was significantly different from zero, rubber A definitely having a higher value than B. Now why did he get such a different answer?

Before discussing this, let us consider a third thing which it was pointed out that he should do, i.e. to arrange the rubbers in order of laboratories, as shown in Table 3. When this was done he got the *same answer* as he did from Table 2. We can now realize what has happened: there is a *systematic* difference between the testing methods in the different laboratories which causes Laboratory IV to get high values, and Laboratory V to get low ones. This systematic effect is super-imposed upon the random errors of test which are present in all the laboratories and has blurred the comparison made in Table 1. (N.B. If none of the variation can be logically allocated to a systematic source, then it is proper that the comparison should be blurred as in Table 1, and the effect in Table 2 is produced by illegitimate juggling with the figures.) In Table 3 the systematic difference between the laboratories has been removed because for each pair of figures the difference is taken between the results from the *same* laboratory, and the differences are independent of the laboratory effects, thus leading to improved precision in estimating the difference between the rubbers.

In this *particular* case he accidentally obtained the "improved" answer by arranging the values in serial order, but this was only because it was proper to remove the significant variation between the laboratories to obtain a valid answer. The process of arranging the results in descending order will always remove some variation, and in this case it happened to do exactly the right thing, but in ordinary cases this manipulation of the results, and then taking differences, would wrongly remove some arbitrary amount of variation, which ought to be present, because it is part of the error in the experiment.

There is no objection to arranging the experimental results in descending order *provided* they are not examined in pairs in such a way as to remove artificially part of the random variation which is present, and it is sometimes quite convenient to arrange them in this way because it shows up the range of values. This subject is also dealt with by R. A. Fisher in his "Design of Experiments."[5] If any of the readers of this note are interested in alternative ways of examining these same hardness results, they are referred to the *India Rubber Journal* of May 15, 1948;[6] while the interesting experiment of asking the five laboratories to repeat their measurements is discussed in the issue of May 29.[7]

[5] See Section 19, pp. 44-46, First Ed., (1935); or pp. 39-40, Third Ed. (1942).
[6] P. 646.
[7] P. 708.

Malayan Industry Worried

Legal Aid for Rubber

At a session of the Legislative Council in Kuala Lumpur early in August the unofficial members unanimously passed a resolution moved by Sir Sidney Palmer demanding separate representation for Malaya at all meetings of the International Study Group, and now a Rubber Secretariat is to be established in Kuala Lumpur.

It is further learned that the High Commissioner, Sir Henry Gurney, agreed to the request of leaders of the rubber industry to increase the cess on rubber exports by 0.15-cent per pound to provide funds for the industry's propaganda battle against synthetic rubber. This increase brings the cess on rubber to 0.40-cent per pound and is expected to raise an additional $2,000,000 (Straits currency) a year.

A matter that was still under consideration was the request of a contribution by Malaya of $22,895,000 (Straits currency) to help finance a five-year development and research program to be undertaken jointly by the British Rubber Development Board, the British Rubber Producers' Research Association, and the Rubber Research Institute of Malaya. It is planned to reserve half of this amount for the Rubber Research Institute and about $11,000,000 (Straits currency) to the other two organizations. This program will be separate from the rubber publicity plan.

Slump in Penang Rubber Trade

Ever since the end of the war Penang's formerly lucrative trade in native rubber from Siam has been dwindling until at present it has become very small indeed. Separate prewar figures for Penang are not available, but it is known that nearly all of the 15,000 tons of Siam native rubber entering Malaya in 1939 went to the remilling factories and depots of Penang. Figures for 1946, show 7,004 tons of Siam native rubber entering this port; in 1947 the quantity dropped to 4,052 tons, and in 1948, to 1,625 tons. The reason for this decline is found in the policy adopted by the Siam Government since the end of the war to encourage production and exports: merchants shipping rubber to the United States may keep a large part of the dollars thus earned to do with as they please. At first they were permitted to retain 50% of the American dollars, then 60%, and recently the percentage had reportedly gone up to 80. A former president of the Penang Rubber Exchange is quoted as stating that because of this policy rubber dealers in Siam could offer the native producers as much as $17 (Straits currency) per picul (142.6 pounds) more than he could obtain in Penang.

But not only Penang has suffered on account of this state of affairs; Malaya as a whole is feeling the effects; before the war total shipments of all rubber from Siam to Malaya came to 40,000 tons a year. But now not only is Siam not exporting her rubber via Malayan ports, but is attracting smuggled rubber from the adjoining Malayan states of Kedah and Kelantan, and even from Sumatra. Rubber dealers, especially in Penang, have accordingly been urging a return of 20% of American dollars to help them meet the competition from Siamese dealers.

Rubber Road Experiments

The growing interest in rubber roads recently becoming evident in Malaya has apparently received a stimulus from the reports of the experiments being carried out in America with rubber-asphalt roads. Now it is learned that the British Rubber Development Board is sponsoring rubber roads in Singapore and Penang. In Singapore a stretch of asphalt road in which rubber is incorporated is to be laid along Keppel road. Rubber powder for this purpose will be supplied by Cressonite Industries, Singapore, and it is understood that the length of the section to receive the new surfacing will depend on the account of rubber powder available. The Netherlands technician, Dr. Van der Bie, and technical officers from Java will supervise the work. Dr. Van der Bie seems to have recommended experimental roads for Singapore and Malaya in general composed of a mixture of 70% sand, 11.5% stone, 8% filler, 10% asphalt, and 0.5% rubber powder.

No specific information about road plans for Penang is as yet available, but work here no doubt will follow the lines adopted in Singapore.

Meanwhile it is announced that the Kuala Lumpur Municipality has completed preparations for rubber road tests in that city. Here the plan is to construct eight strips of road, four for testing and four for control, with test and control strips laid down side by side. Among the sites chosen for the experiments is one near an important bridge and another in front of the Kuala Lumpur railway station, both subject to heavy traffic.

Time as a Process Variable[1]

Joseph S. Detwiler[2]

IS "TIME as a Process Variable" important and worthy of investigation? I think it is. The acceptance of time controllers in industry is no longer a conjecture, but a fact. Suppose we list some of the reasons for this.

PROCESS INDUSTRIES' ACCEPTANCE OF TIME CONTROLLERS

1. Higher Quality ..... Greater uniformity.
   It is the desire of every manufacturer to produce goods of *higher quality*, which infers *greater uniformity of product.*
2. Lower costs ..... Reduction of waste.
   Lower unit cost is extremely important in the face of rising costs of raw materials, which infers *reduction* in *waste* and *time saving.*
3. Greater productivity .....Time saving.
   Equally important is the need of greater productivity. This hardly needs any further explanation, but it does have a corollary, and that is that productivity increases with time saving and with decrease in physical exertion.
4. Safety in hazardous operations ..... Fully automatic operation.
   There is a growing recognition that hazardous operations can be more safely conducted by fully automatic control.
5. Change in our thinking.
   The last, but not least of these observations is the change in our thinking. Time has become a greater factor to us than probably to any other generation in history.

Of all these five factors, the first three are probably the most predominant. They are economic factors which must be weighed very carefully in determining an adequate coordinated control system which will produce the desired and required results.

Time Applied to Control Systems

Time as a process variable is of the greatest significance in batch processing. A housewife will verify this point, since she does much of her cooking, canning, and baking on a time basis. In industry, time is also equally important in batch processing. The canned foods which we eat would probably neither be safe nor palatable if the time were overlooked in their processing. The same thing is true of the milk we drink. The tires that we drive on give years of safe service because time has been very carefully considered in their manufacture. There are hundreds of other examples one might cite that make for better living, because *time has been recognized as a process variable.*

In discussing automatic controllers for industrial process work, we are quite likely to group together such variables as temperature, pressure, liquid level, and flow. Not often, however, is time included in this group. This neglect may be because it is difficult to bring ourselves to think of time as a controlled variable. One does not control time by pinching off its flow with a valve as one might do with the other process variables. But, if we think of it in terms of *pinching off the process* at the end of a measured interval of time—then time becomes a process variable like the rest.

[1] Presented before the Rubber & Plastics Division, A.S.M.E., Erie, Pa., Sept. 28, 1949.

[2] Divisional sales manager, Taylor Instrument Cos., Rochester, N. Y.

Time Cycle Controllers

It is interesting to digress for a moment to appreciate fully the importance industry has placed on the time cycle controller. Not too many years ago these units were considered to be strictly in the "gadget" classification. However, as industry grew, and automatic control problems became more complex, process control engineers began to appreciate that timers were something more than just mere "gadgets." Engineers found that, when properly applied, timers are extremely useful tools to greater industrial control accomplishments.

To meet the intensive demand for production placed upon the United States during the past few years, industry looked to modern instrumentation for a helping hand. The result has been that during the post-war period, with its shortages, rising costs, and labor problems, industry has continued with its control programs as a solution to some of its present difficulties.

At present there is an ever-increasing demand for a greater coordination of the variables in industrial control problems. The time cycle controller is well recognized as the coordinator of these control variables. It is often said that a timer is the "heart" of a coordinated control system. Examples of this modern trend to coordinated instrumentation are most outstanding in the rubber, petroleum, chemical, and allied industries. It has coordinated various related batch processes and caused them to function as one continuous working unit.

It is interesting to review our progress in the time cycle controller field. Our pioneering efforts in this field date back many years to a simple, single-function timer, rotating at a fixed speed. As the need of timers, capable of performing a multiplicity of functions became apparent, multiple-cam timers of the fixed speed type were designed. It was soon recognized that a multiple-cam timer with a variable speed drive mechanism was unquestionably the next step in the advancement of the timer field.

This brings us logically to the major forms of time cycle controllers and their application to industrial processes.

First, let us examine a *time cycle controller.* Many different types of industrial time cycle controllers are available today. Their design features and construction vary widely; however their objective is the same in that they provide a device by which a predetermined series of related events take place in a pre-selected time interval.

Many new and improved features have been added to this timer which increase its effectiveness and reliability as a time cycle controller. The function of the instrument is to provide control for any particular group of functions required by a manufacturing process. This is accomplished according to a pre-determined schedule during a specific cycle or timed period. These functions may be activated either pneumatically, electrically, or by using any combination of the two according to any set of operating specifications within the limits of the instrument.

Activation of control equipment is accomplished through the use of pneumatic valves and electric switches. These are connected by mechanical linkage to

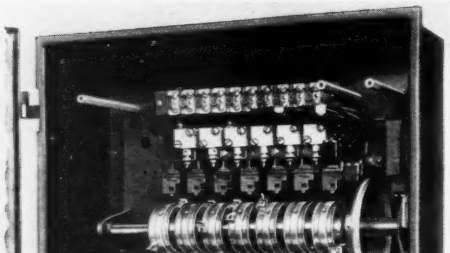


Fig. 1. Flex-O-Timer Time Cycle Controller

operators which in turn are set in motion by actuating pins from a central drum. The drum is set to rotate and complete one revolution each cycle or time period. Actuating pins are set about the circumference of the drum in such a position as to coincide with the particular operating schedule of the functions involved in the cycle. It is due to the fact that the cycle drum distinguishes this instrument as one of the multiple-cam type that it is possible to repeat several functions during the course of a cycle without having to resort to external locking devices.

The cycle drum is driven by a synchronous motor through a gear train. A fixed speed drive is used where the time cycle is specified as unchanging. Often, however, a more flexible installation demands variable cycle times. These are provided for by incorporating an adjusting device into the driving mechanism through which the cycle time can be varied within a given range by changing a dial setting. This feature, together with the adjustability of function operation within the cycle, makes for maximum instrument flexibility.

The physical relation of the component parts of the Flex-O-Timer is shown in Figure 1. Immediately beneath the 10-place terminal strip at the top of the case are seven control functions, six of them pneumatic and one electric. Connected to the control functions from below are the seven operators, which in turn are set in motion by the actuating pins mounted upon the cycle drum. To the right, and above the time dial, which is mounted on the drum shaft, is the solenoid. This unit is capable of instantaneously actuating five operators at the start of the cycle. In addition, it can also actuate a single-pole double-throw switch, which is shown to its immediate left. In the lower half of the case are housed the gear train, motor and capacitor, motor brake, signal light, toggle switch, and separate terminal block.

Application of Time Cycle Controllers

One of the most common applications of the time cycle control, coordinated with temperature control, is the platen press for compression molding of rubber and plastic products.

Figure 2 shows a typical platen press application involving time cycle control, press operation, heating, condensate removal, and cooling. All functions are performed automatically, and the cycle of the operations is as follows.

The press is loaded, and the "start" button depressed, which action actuates the timer solenoid to start the timer and simultaneously supplies air from functions 3 and 4. Function 3 applies air to the temperature controller and condensate removal timer, and platen heating begins. Function 4 positions the three-way hydraulic valve to close the press rapidly. When the press is practically closed, the limit switch operates to close valve 5 and slow down the press closing. After the initial heating and closing period, the timer starts the small cure timer housed within the master timer and then stops itself. The cure timer completes the cure and then restarts the main timer, which then functions to shut off the steam through function 3 and actuates function 5 to admit cooling water and open the drain connection. At the end of the cooling period, the water is shut off, and functions 4 and 6 operate to close off the hydraulic pressure and close the sump connection, and the press is held closed for a period of time. At the expiration of this period the sump valve is opened, and the press opens, and the master timer stops, having completed the cycle.

One of the more unusual timer applications is found in the chemical industry for controlling gravimetric chemical feeders. Figure 3 is a schematic layout of such a system where time is the only variable which is controlled to obtain the correct proportioning of the ingredients.

Before the start of the cycle the bins are loaded, and the conveyer screw is rotating. The "start" button is depressed, and the timer is started, and function 2 starts feeder motor No. 1. After successive predetermined time intervals, feeder motors 2, 3, and 4 are started, respectively. The timer then stops for a period of time.

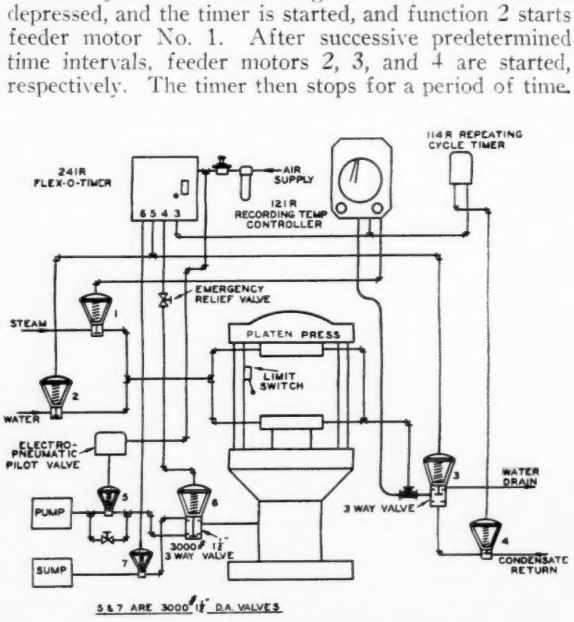


Fig. 2. Coordinated Control System for Platen Press

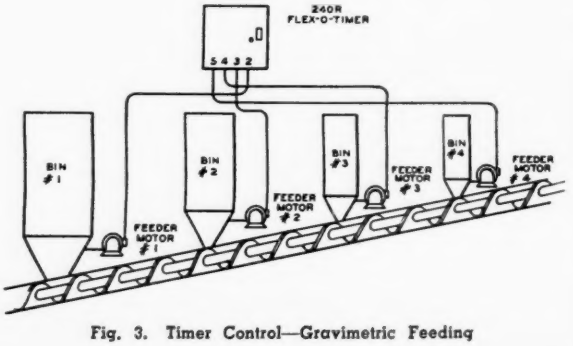


Fig. 3. Timer Control—Gravimetric Feeding

as determined by the operator, all feeders operating. The timer is then again started and completes the cycle by turning off the feeder motors successively by time intervals in order to maintain the proper proportioning.

As previously mentioned, the time cycle controller is often found to be the master instrument of a completely coordinated control system. We might look at a relatively complicated system, not with the idea of trying to explain how each device operates, but rather of what it is designed to accomplish.

The process shown in Figure 4 calls for a rather high degree of instrumentation for moistening or tempering leaf tobacco prior to its manufacture into cigarettes or other tobacco products. The tobacco is in tightly packed hogsheads holding about 1,000 pounds each. The leaves, tied together in bunches or hands of about 20 leaves each, are very dry and brittle, having been aged for a year or more, and cannot be unpacked in this condition, as the resultant breakage would entail an intolerable loss. The purpose of the tempering process is to moisten the leaves throughout the mass after removal of the staves and top of the hogshead. The plugs of tobacco then stand as vertical cylinders and are conveyed on a truck or dolly into the tempering unit.

The automatically controlled tempering process starts after the door is lowered and locked. The chamber is first evacuated to 0.2-inch of mercury absolute, and then the pressure is raised to 10 inches of mercury absolute by the admission of steam; each of these conditions is maintained for a definite time interval. This cycle is repeated from two to five times. During the "pressure" period, Micromist is introduced for a brief period. This is superheated water at 300° F. or higher. A portion of this flashes, but the remainder is carried as fog, into the mass of tobacco. After the last steaming operation the vacuum is broken with air, the chamber manually opened, and the tobacco removed warm and moist, having absorbed 30 to 50 pounds of water per 1,000 pounds of tobacco. In this condition the tobacco is easily separated without breakage.

This set of operations appears to be fairly simple, but requires many interlocking and safety devices in order to carry out the cycle, and so that subsequent operations cannot be performed unless certain conditions are met after the completion of the previous operation.

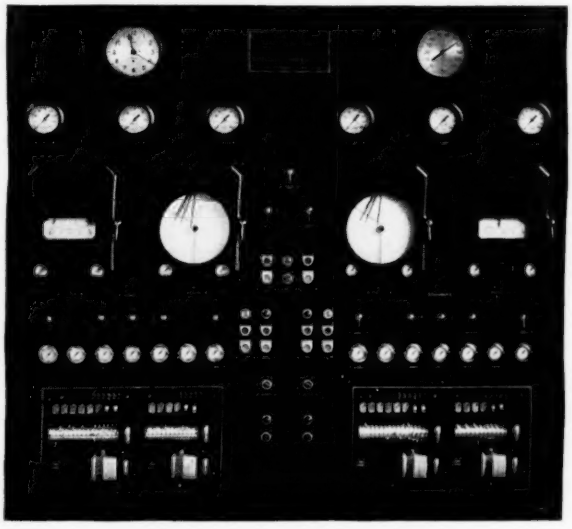


Fig. 4. Control Panel for Tobacco Tempering Unit

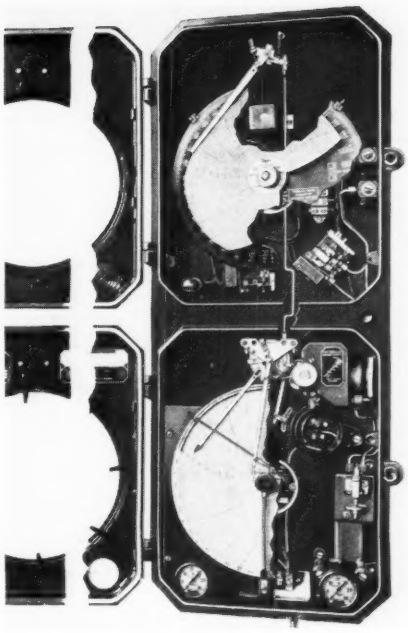


Fig. 5. Time Schedule Controller

Time Schedule Controller

The next instrument to be considered in this discussion of time controllers is the time schedule, or contour controller. This controller is applicable wherever a process variable must follow a predetermined schedule with relation to time. Let us see what components go to make up a time schedule controller. Figure 5 is an interior view of this instrument.

The lower portion of the case of this instrument contains the conventional air-operated controller actuated by temperature, pressure, flow, liquid level, load, etc., and incorporating any form of control response depending upon application conditions and may be of the single- or double-duty form.

The upper portion of the case contains the cam, cam motor, cam follower, and timing disk for actuating auxiliary functions on a purely time basis. The cam, which is the same size as the recording chart, carries the contour of the process schedule and is driven by a synchronous speed motor available in a variety of revolutions. The knife-edge cam follower follows the contour of the cut cam and transmits the motion through a direct linkage to the movement assembly in the lower case and adjusts the set pointer of the controller mechanism. The time disk also rotates with the cam and serves as a means for carrying the trip clamps located around its perimeter for operation of the trip units. These units actuate process functions on a time basis and may be pneumatic, electric, or a combination of both. Signal lights and air gages may be incorporated in the instrument.

Applications of the Time Schedule Controller

The applications of the time schedule controller to industrial processes are extremely varied. Because of the nature of the instrument, it lends itself readily to the rubber vulcanizer application shown in Figure 6, which illustrates a completely automatic coordinated control system in which both a timer and a time schedule controller are applied.

In this system the timer performs the preliminary

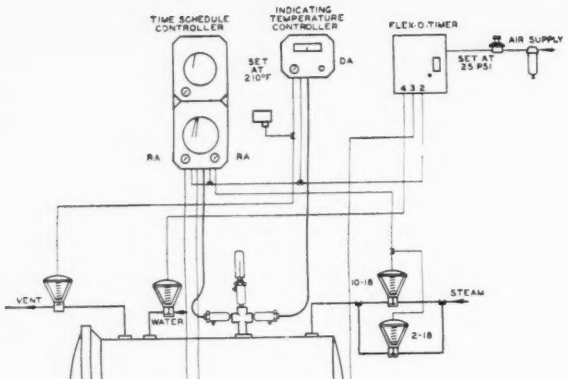


Fig. 6. Coordinated Control System for Horizontal Vulcanizer

functions of closing the blow-down valve and admits the air supply to the time schedule controller which opens the steam supply to the vulcanizer. The timer then stops itself. The temperature is raised as fast as possible; air is vented through the vent valve until a temperature of 210° F. is reached. At this point the indicating temperature controller functions to close the vent valve and give a starting impulse to the time schedule controller, and its cam rotates to raise the temperature according to the schedule cut on its cam. After reaching curing temperature, the instrument times the length of the cure. During the cure, condensate is continuously removed by the second control system in the time schedule controller. At the end of the cure period the time schedule controller restarts the timer, which then shuts off the steam supply, opens the blow-down valve, turns on cooling water for a timed interval, shuts off water, and then stops itself, signalling that the cure is terminated.

Process Time Controller

There is still another instrument which might also be rightfully included in the time cycle classification. This instrument is known as the process time controller and times the duration of a controlled process after the desired control point has been reached. The time of rise of the variable from the starting point to the holding set point is uncontrolled.

This instrument enjoys its greatest popularity in the food and textile industries where, in canning and dyeing processes, the time of rise to holding temperatures is relatively unimportant; whereas the length of time at cooking or holding temperature is very critical.

Summary and Conclusions

The reasons for considering time as a process variable in the application of automatic control systems to industrial processes, as well as the other well-known variables such as temperature, pressure, rate of flow, and liquid level, have been discussed. The essentials of a time cycle controller are described, and its application to several industrial processes as the heart or brain of a coordinated system is explained.

Many varied applications require that time be seriously considered as a process variable in order to produce higher quality, greater uniformity, lower costs, reduction of waste, greater productivity, time saving, and safety in modern manufacturing operations.

Rubber Developments from Indonesia

Following the lead of Bobilioff and Kortleve, J. S. Vollema carried out a series of experiments to determine the influence of hydrogen-ion concentration on the growth of *Hevea*.[1] He found that in the case of young rubber, the higher the degree of acidity of the soil (except perhaps highly acid soils which very rarely occur in practice) the better the growth of the trees. Older rubber is far less susceptible to soil acidity and does not begin to show definitely poorer growth until a pH 8 is reached.

The degree of response to soil acidity by young rubber depends on the type of soil. Thus despite a narrower pH range, differences were more marked in sandy loam than in clayey loam.

Satisfactory growth of young rubber also occurs where the top soil is acid and the subsoil alkaline, provided the upper layer is sufficiently thick (75 centimeters or more). Soils having physically poor marly loam near the surface cannot be economically made suitable for rubber growing by the application of sulfur, although such a procedure could be useful in the case of slightly acid to alkaline soils having good physical properties.

Certain important rubber concerns in Deli, Sumatra, are said to have begun packing rubber for export in paper bags instead of cases or other types of packings. It seems that 25,000 kilograms of rubber have already been shipped to Europe in this new wrapping, with considerable saving in freight charges and cargo space. The rubber is first packed in a non-adherent sheet and then placed into paper bags; each bale weighs 50 kilograms, that is, 20 bales to a ton. This method has been developed by the Rubber Stichting, Delft.

[1] *Arch. Rubbercult.*, June, 1949, p. 257.

Reports on Rubber from Ceylon

According to latest reports, the Government of Ceylon is sponsoring a tire factory in Colombo at a cost of 5,000,000 rupees. Necessary capital will be supplied by the government, local private enterprise, and The General Tire & Rubber Co.; the American company will provide one-fifth of the amount required, and the government and Ceylon interests together will contribute the remaining four-fifths. The factory will manufacture high-grade tires and certain mechanical products both for domestic use and for export, with the American company providing the technical experts to guide and supervise production. It is planned to appoint nominees of the Ministries of Finance and Industries to the board of directors of the new enterprise.

Certain rubber growers here have been inquiring about the propaganda scheme for natural rubber in America to be launched by the British Rubber Development Board, and apparently many rubber men in Ceylon would also be ready to pay a cess on rubber to help meet the cost of the plan.

In view of the fact that rubber mats, windshield heading (except of sponge rubber), window channeling of rubber, tire valves, dust caps and shock-absorber bushes of rubber are now being manufactured locally, the Ceylon Government has decided to stop issuing import licences for these goods until further notice.

The depressed condition of the Ceylon rubber industry has caused the government to reconsider proposals — first offered in 1946 and abandoned — for establishing central-controlled factories for processing rubber. The factories would produce, among the rest, white or almost white latex crepe, carbon black rubber, nitrate crumb, rubber powder, and three forms of concentrated latex.

Laboratory Testing Rubber Bearings—II[1]

J. R. Beatty[2] and D. H. Cornell[2]

THE following installment concludes the informative article on the laboratory testing of rubber bearings, of which Cutless[3] bearings are a well-known example, which was started in our November issue.

Wear and Friction Tests

Tests for wear and friction are affected by the condition of the surface of the journal. In order to obtain reproducible results, a standard procedure was adopted in preparing the journal for test. All the journals of the test machines were turned to a very smooth finish and were polished with #0 and #4/0 metallographic paper. This polishing was done with the journal rotating so that any minute scratches would be circumferential. The journal was washed with soap and water, rinsed with water, then alcohol, and then with clear water again. Akron, O., city water was used in all tests as the lubricant.

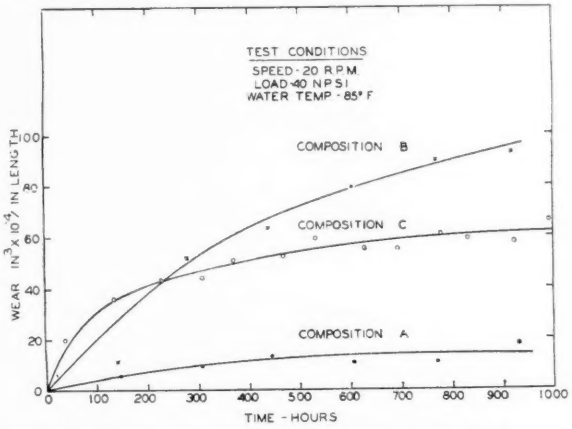


Fig. 9. Wear *versus* Time for Bearings of Three Different Compositions

All new rubber strip samples are ground with the surface flat. As the strips are worn in, the surface of both the journal and the bearing will change, and the friction and the rate of wear will vary. The general procedure with the small friction tester has been to obtain some measure of the way in which these factors vary, but to pay more attention to results obtained after the strips are worn in. This takes from four to seven days on the small friction tester, depending on the speed and bearing loads. By cleaning the shaft again at that time, an opportunity is afforded to determine separately the changes in the shaft and in the bearing. With the full-scale machine the test is usually continued for 30 days.

The amount of wear is always given as the volume of material removed. The width of the worn surface of the strip is measured to 0.01-inch and the depth of wear to 0.0001-inch.

Test Results

The bearing materials that have been tested cover a wide range of properties represented by lignum vitae, phenolic bonded and impregnated laminates, nylon, and a large number of elastomers. The latter includes natural rubber, GR-S, neoprene, butadiene-acrylonitrile copolymers, polyethyl acrylate, and plasticized Geon resins. In this group the properties of the bearing depend on the choice of polymer and on the type of compounding, e.g., the vulcanization ingredients, reinforcing pigments, and softeners. Taking these factors into account, a wide range of materials has been investigated. Most of the results discussed here were obtained with three compositions which do not necessarily represent the best performance obtainable with the polymer. The identifying letters, A, B, and C are consistent throughout the paper and refer to one particular composition of butadiene-acrylonitrile, GR-S, and natural rubber, respectively. Reference is also made to a few modifications of these three compositions which resulted in outstanding performance on one or more properties.

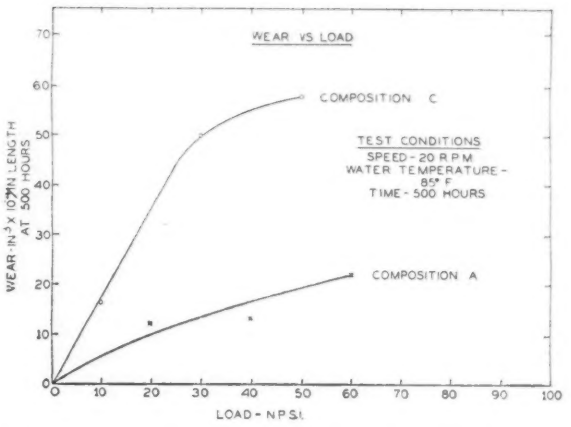


Fig. 10. Wear *versus* Load for Bearings of Two Different Compositions

WEAR. Typical data for wear obtained on rubber Cutless bearings are presented in Figures 9, 10, 11 and

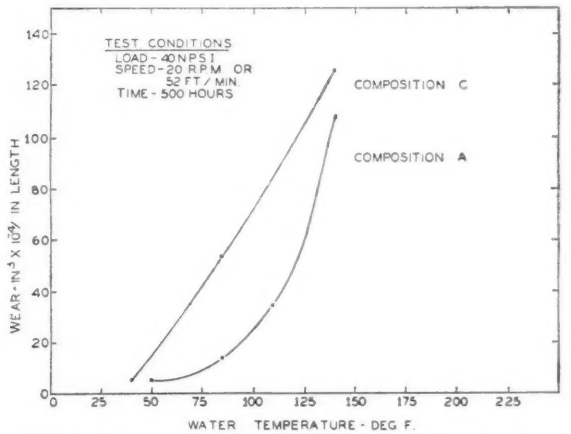

TEST CONDITIONS
LOAD - 40 N.P.S.I.
SPEED - 20 R.P.M. OR 52 FT./MIN.
TIME - 500 HOURS
COMPOSITION C
COMPOSITION A
WEAR - IN⁻³ X 10⁻⁴ IN LENGTH
WATER TEMPERATURE - DEG. F.

Fig. 11. Wear *versus* Temperature for Bearings of Two Different Compositions

[1] Presented before the Rubber & Plastics Division, A.S.M.E., New York, N. Y., Nov. 28, 1949.
[2] B. F. Goodrich Research Center, Brecksville, O.
[3] Registered trade mark of The B. F. Goodrich Co., Akron, O.

Table 2. Wear as a function of time, as measured on the wear tester, is shown for three compositions in Figure 9. The rate of wear decreases with time. As the area of contact between the bearing and journal increases, the pressure decreases, resulting in less wear. Figure 10 shows wear as a function of load; Figure 11, wear as a function of temperature; and Table 2, wear as a function of speed. The load determines the film thickness of the lubricant; with increased loads this film

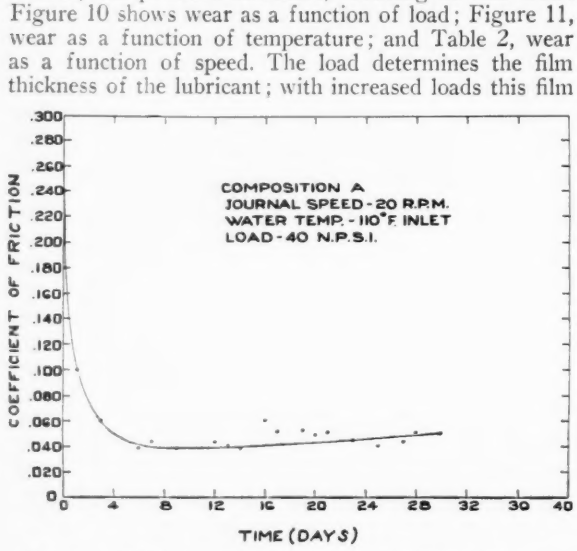


Fig. 12. Coefficient of Friction *versus* Time, Full-Scale Tester, Composition A

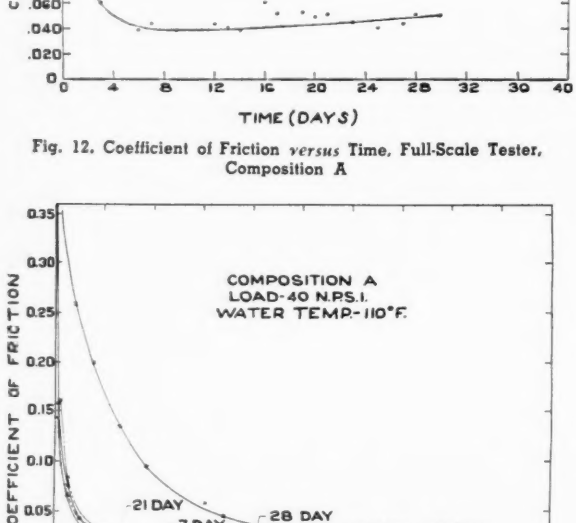


Fig. 13. Coefficient of Friction *versus* Speed, Full-Scale Tester, Composition A

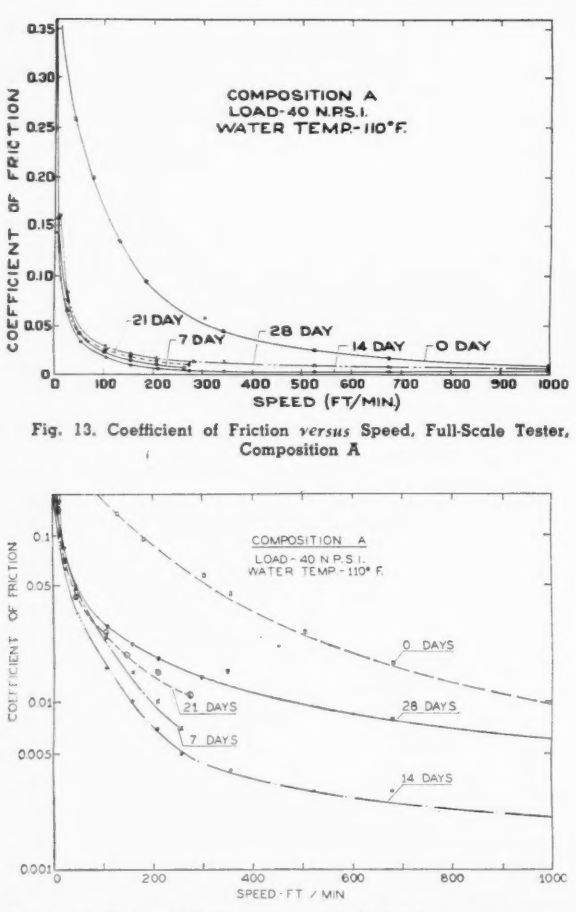


Fig. 14. Coefficient of Friction *versus* Speed, Full-Scale Tester, Composition A, Different Friction Scale

becomes thinner, and apparently contact is made between the journal and the bearing, at least in a few places, and the rate of wear increases. About the same reasoning applies to the effects of temperature. The viscosity of the water is diminished with increasing temperatures, decreasing the film thickness. Slow speeds allow the lubricating film to fail at least in part so that wear is dependent upon speed also. All of these factors affecting wear have been utilized in order to secure data more rapidly. Though the accelerated laboratory tests have been considerably more severe than the conditions of wear in actual service, the results obtained thus far have been an accurate guide to the service performance of the bearings.

Table 2. Wear as a Function of Speed

Speed R. P. M.	Wear–In. 3 x 10-4/In. Length	
	Composition C	Composition A
20	203	81
200	112	31

Test Conditions: Load: 40 n.p.s.i.; water temperature 110° F.; water flow—5 gallon/min.; time—28 days.

Friction. In the laboratory tests the coefficient of friction changes rapidly when the bearing is first put into use. As the bearing wears in, both the contour and the surface change. Typical results are shown in Figures 12, 13, 14 and 15. Figure 12 shows the coefficient of friction on Composition A at one speed and one load at various times during a typical 30-day test in the full-scale tester. During most of this time the bearing was subjected to a load of 40 n.p.s.i. and the speed was 20 r.p.m. The curve drops rapidly at first, then flattens out, and after a long time shows a gradual rise. This rise probably takes place much more rapidly in the laboratory test than it does in actual service. Figures 13 and 14 show other data from the same test. Here results at various speeds are shown for a few selected times during the break-in period. In general, the friction drops rapidly at first and remains fairly low. Figure 15 shows similar data obtained on the small friction tester. Included here are results obtained as soon as possible after starting the test, after four days, and after seven days break-in, and similar results after cleaning the journal. Slow speed and high load were the break-in conditions.

Figure 16 shows results on the same type of bearing in the full-scale tester as a function of speed and load. These were obtained after 14 days' wear-in.

Figure 17 shows the coefficient of friction as a function of speed for a load of 30 n.p.s.i. for three different compositions, A, B, and C. Figure 18 shows data se-

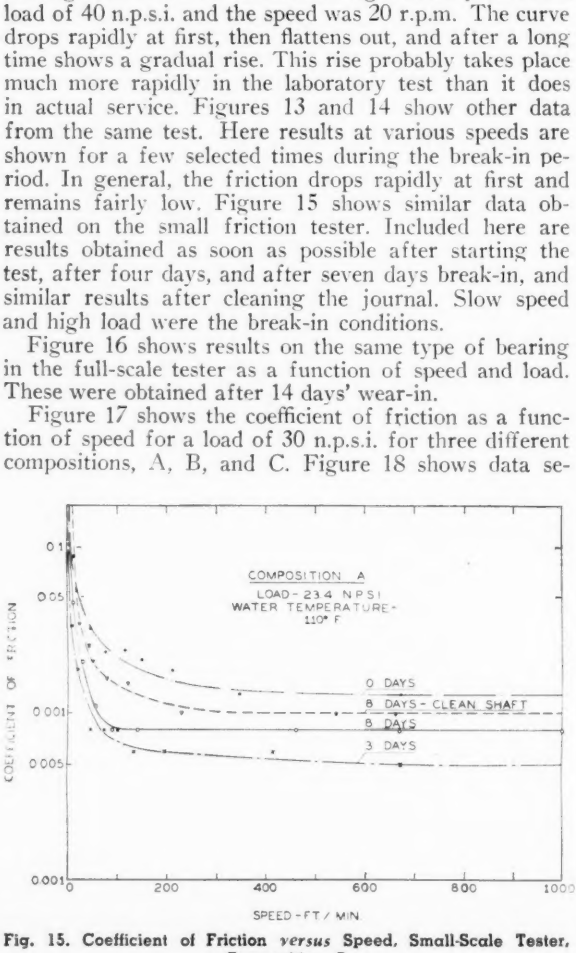


Fig. 15. Coefficient of Friction *versus* Speed, Small-Scale Tester, Composition A

lected from the same test giving the coefficient at different loads for two speeds, 300 and 600 feet a minute. The difference between the various compositions is a little difficult to explain. Apparently the lubrication is not "thick film," and small variations in surface roughness are important. Composition A wears smoother and gives consistently lower friction.

Figure 19 shows the effect of temperature on friction in terms of % change from that of 45° F. The coefficient increases rapidly with increase in temperature, for all bearings. This increase is apparently greater for the Composition A bearing, but even so, the actual value for coefficient of friction is still lower than for the Composition C bearing at 140° F.

It is possible on the full-scale bearing tester to determine the friction by means of the temperature rise and flow rate of the water lubricant. This provides a check on friction measurements, and the equations developed may be utilized to determine necessary flow rates to maintain reasonable operating temperature.

Noise Tests

As stated before, rubber bearings are relatively quiet, and for ordinary use there can be little complaint about noise that can be attributed to the bearings. It is necessary that there be absolutely no noise at any time for some uses. Reports have been received that under certain conditions the bearings have made a slight amount of noise, apparently of very short duration.

The problem then was to reproduce this noise in the laboratory so that the cause could be found and the condition remedied. As might be expected, this job turned out to be very difficult. None of the people working on the project has ever heard this noise in service. Under some conditions the bearings could be made to squeak, but the usual occurrence was that the noise would start and stop without any apparent reason. After considerable experimentation conditions were found under which consistent results could be obtained.

One essential factor is the surface of the journal and bearing. A reproducible journal and bearing surface was obtained by wearing in the bearing under controlled conditions. In the small friction tester, a test strip was worn in at a load of 40 n.p.s.i., a speed of 20 r.p.m. and a water temperature of 140° F., for four days. During this time chemical reaction apparently took place between the water and the journal; some calcium carbonate was formed, and the journal surface had a standard roughness that could be duplicated. Then the load, speed, and temperature could be varied, and any consistent occurrence and disappearance of noise in the different bearings could be noted.

In most cases observations were made by ear. For some tests a General Radio sound level meter and sound analyzer were used.

A typical spectrum of noise is shown in Figure 20. The driving machinery causes considerable trouble, and

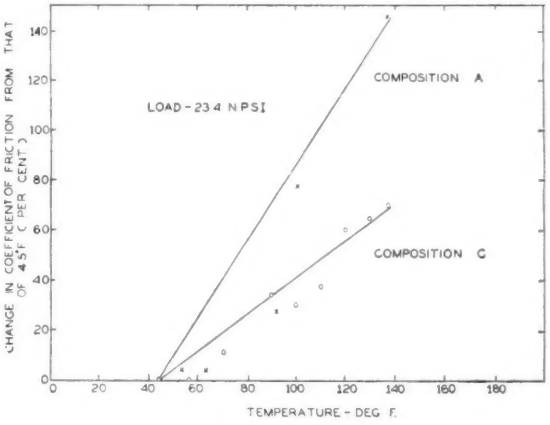


Fig. 19. Effect of Temperature on Coefficient of Friction, Two Compositions

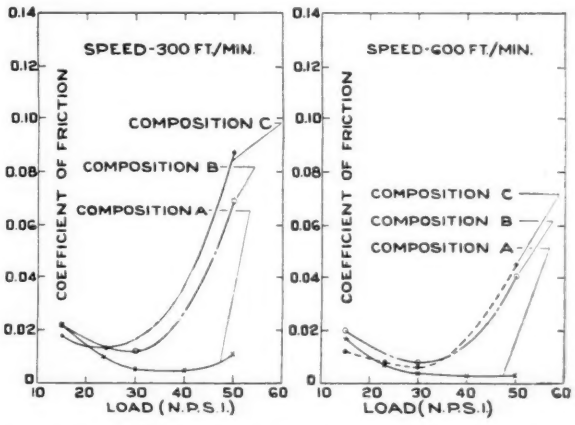


Fig. 18. Effect of Load on Coefficient of Friction, Three Compositions, Two Speeds

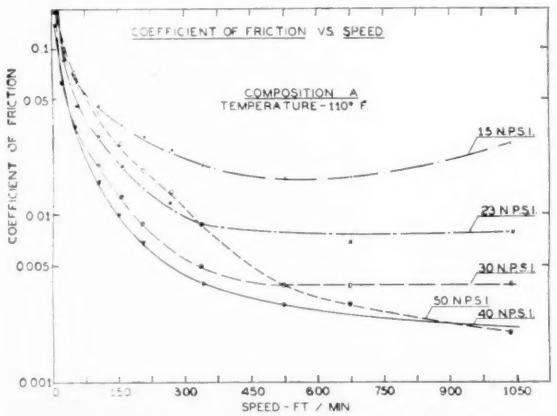


Fig. 16. Coefficient of Friction *versus* Speed, Full-Scale Tester, Composition A, Load and Speed Both Varied

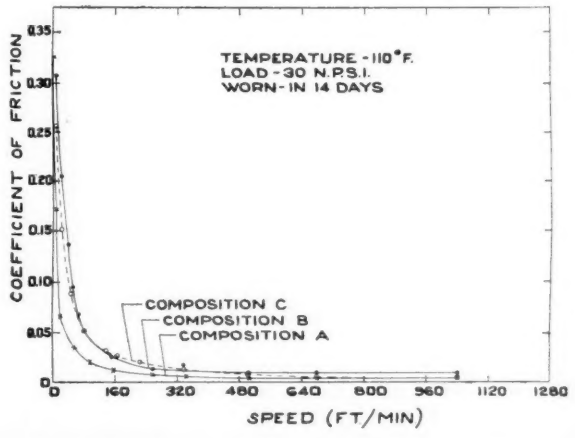


Fig. 17. Coefficient of Friction *versus* Speed for Three Different Compositions

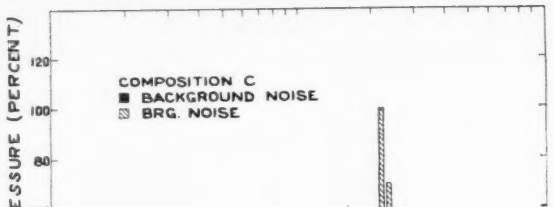


Fig. 20. Typical Spectrum of Noise for Rubber Bearing

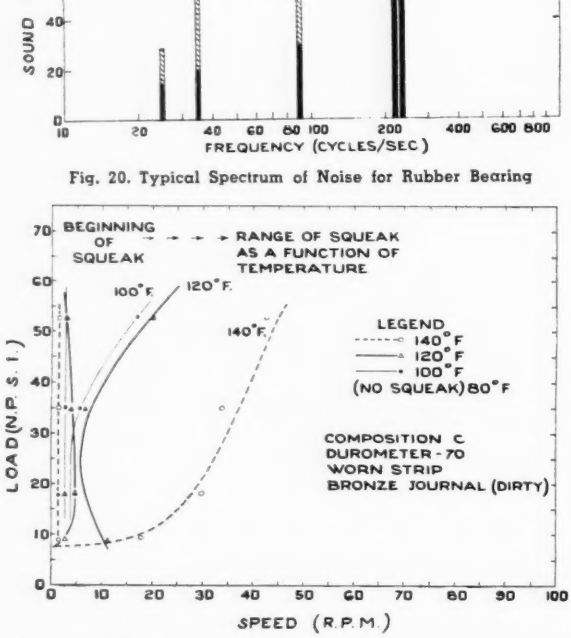


Fig. 21. Noise as a Function of Load and Speed, Composition C

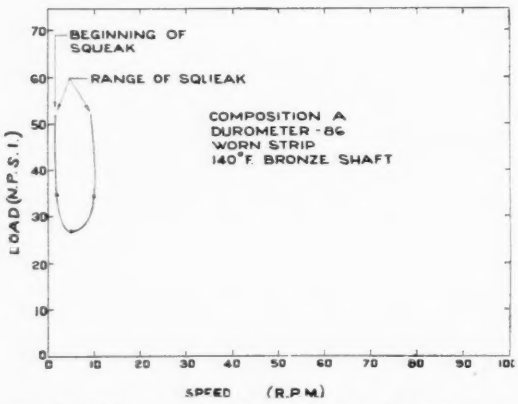


Fig. 22. Noise as a Function of Load and Speed, Composition A

the sound from this is shown by the solid portion at the various frequencies. The noise from the bearing is represented by the cross-hatched portion at the different frequencies.

Typical results are shown in Figures 21 and 22 for compositions C and A. In both figures the occurrence of noise is indicated as a function of speed and pressure at a few selected temperatures. Figure 21, for example, shows that noise occurred at any combination of speed and pressure lying between the two curves for each temperature. At 80° F. no noise could be produced at any speed or pressure. At 100° F. there was noise only above 2.5 r.p.m. and below 3.5 to 18 r.p.m. for loads of 13 to 60 n.p.s.i. At 120° F. the lower limiting speed was lower and the upper limiting speed higher, and noise was produced over a considerably greater range of speed and load. Figure 22 illustrates the great reduction of noise that can be obtained by compounding. No noise could be produced with this composition at any speed or load, at temperatures below 140° F. At 140° noise occurred only in the region above the curve, that is, roughly from 2 to 10 r.p.m. at loads above 27 n.p.s.i.

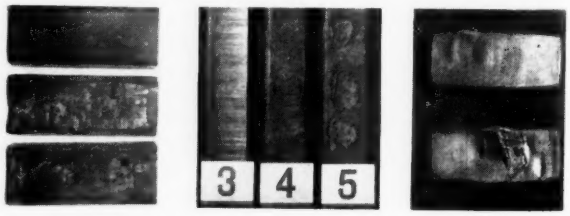
Although the phenomenon is not very well understood, it is certain that the noise results from vibration of the strip and/or journal. Friction is undoubtedly a factor, and the good performance of some compositions correlates with their low coefficient of friction.

Studies of construction and materials were undertaken after the noise test was developed. This work resulted in several types of improved bearings. Under the conditions available in the laboratory we have not been able to make some of these squeak at all. No service tests have been run on these improved bearings, but it is not likely that service conditions can be enough more severe than our laboratory test to be significant, and it is not likely that these bearings will make any noise in a ship.

Impact Tests

The rate of wear of these bearings is so slow that generally they are in very good condition even after very long periods of time. Sometimes ten years' use shows little wear on removal from service. Recently a few strips have shown peculiar damage after only a very short time. There were deep pits and torn places on the surface and in or under these pits, spots of soft, sticky elastomer. Some service failures show in Figure 23-A.

The cause of these failures was rather obscure. It was thought that they might possibly be due to unusual defects in a few strips or more likely they might result from abuses such as exceedingly high loads or very high temperatures due to insufficient water flow. Fortunately a similar failure was obtained in the laboratory. Some trouble had been encountered with eccentricity of the shaft in the full-scale tester, and at one time the total throw was 0.010-inch. During a test under these conditions the failure shown in Figure 23-B was obtained. This looks like the failures obtained in service and is convincing evidence that the condition is due to very high impact forces. Apparently these forces cause fairly large deformation of the bearings, and there is a resulting energy loss and heating of the elastomer. The impact tester previously described was built to emphasize this condition. In early tests very inconsistent results again were obtained. Strips might fail in a matter of minutes, and identical strips run indefinitely without any evidence of failure.



A
Cutless Bearing Strips Damaged in Service

B
Cutless Bearing Strips Damaged in Full-Scale Tester

C
Cutless Bearing Strips Damaged in Impact Tester

Fig. 23. Impact Damage to Cutless Rubber Bearings

It was soon realized that failure resulted from two causes. Heat is generated in the rubber by these impact forces, and heat is also generated at the surface by high friction losses. If the friction is small enough, the energy loss in the rubber is not great enough to cause the temperature to rise rapidly enough to cause failure. The heat is carried away by the lubricating water too fast for failure to occur. High friction losses alone cannot cause a sufficiently rapid temperature rise. If the two losses occur simultaneously, then apparently the elastomer gets hot enough actually to blow-out. In laboratory tests a standard method of preparing the surface of the journal was again adopted. The journal was allowed to stand without turning in water at 120° F. for 48 hours. A short strip was then subjected to loads up to 150 n.p.s.i., and the eccentric shaft rotating at 200 r.p.m. produced impact forces as high as 400 n.p.s.i. Figure 23-C shows the damage to a short strip sample which failed.

Even under these controlled conditions blisters are not always produced. To help in obtaining results, temperatures were measured by embedding thermocouples in the bearing strips when they were made. Temperature rise as high as 327° F. (from an ambient temperature of 120° F.) has been recorded. This temperature rise has been used as a guide to development of improved bearings, and in general there is good correlation between the temperature rise and the occurrence of failure.

After sufficient results had been obtained to show definitely the cause of failure, comparison tests were made with the Goodrich flexometer.[7] If the conditions are adjusted properly, that is, if samples are compared under the same oscillating load range rather than at the same amplitude range, the temperature rise in a flexometer test agrees reasonably well with temperature rise and failure on the impact machine.

The energy loss in the elastomer depends on the force and the deformation, and there is an optimum hardness for low temperature rise. Also the question of blow-out at any given temperature depends on the kind of material. Natural rubber softens at high temperature, but some synthetics tend to harden and become dry. For this reason they show much greater resistance to blow-out, and their use has resulted in greatly improved bearings. Under the most severe conditions that could be imposed in the laboratory no blow-outs have ever been produced in these bearings.

The extreme severity of the conditions necessary to produce this type of failure explains why very few instances have been brought to our attention. In those few cases that have occurred, the conditions of journal surface, pressure, and temperature must have been very unusual. Observations of bearings in service and of tests in the laboratory indicate that even after blow-out the bearings have performed satisfactorily all the functions required of them. Actual service tests have borne out laboratory results in showing that the improved bearings are greatly superior in this respect, and it is not likely that failures of this type will occur with these bearings.

Summary and Conclusion

Rubber bearings have found wide use in marine service and other applications. These bearings, which are generally lubricated with water, consist of a metal housing with a rubber lining operating on a metal journal. Many advantages over other types of water lubricated bearings are realized with respect to wear, friction and noise. The rubber lining withstands abrasives, which may be present in the water lubricant. The lubricant is the liquid which is most readily available such as the water floating the ship or any other liquid being handled by the equipment. The resilience of the rubber functions as a vibration isolator, permits operation with large clearances, and compensates for a limited amount of misalinement.

Tests have been developed on both laboratory and full-scale equipment to measure the important properties with reasonable speed and accuracy. Laboratory-scale testing machines were developed for accurate measurement of coefficient of friction and wear. A larger machine accommodating 10-inch diameter by 30-inch long bearings was used to confirm laboratory test findings.

Research programs planned to utilize these tests have resulted in greatly improved bearings. By suitable selection of elastomers and compounding ingredients, materials for bearings with lower coefficient of friction and longer life have been developed. The rate of wear of these bearings decreases with time in service and in general is proportional to unit load. Running coefficients of friction as low as 0.005 are practical with starting coefficients of friction not exceeding 0.400. Lowering the water lubricant temperature decreases both wear and coefficient of friction. Premature failures and noise found in unusual cases have been effectively eliminated by changes in the construction or composition of the bearings.

[7] "The Goodrich Flexometer." E. T. Lessig, *Ind. Eng. Chem. (Anal. Ed.)*, 9, 582 (1937).

Tensile Properties

(*Continued from page* 302)

that of a substitute for crystallization in natural and other synthetic rubbers, which substitute does not, however, possess the same favorable features. Carbon black even in non-crystallizing rubbers does not increase strength; it merely shifts the optimum strength value to a higher temperature so that this temperature is in the room temperature range.

The temperature coefficient of strength for Butyl and neoprene rubbers is so large at room temperature that a few degrees' difference in temperature causes large changes in strength. The tensile strength and elongation at break of these two rubbers decrease sharply between 20 and 40° C. (68 and 104° F.).

The reported investigations were a part of the work on the fundamental mechanical properties of rubbers conducted by the research department of the Rubber Stichting at Delft.

News from Pakistan and India

The Government of Pakistan is understood to be considering the establishment of a plant to manufacture tires and tubes. It has already accepted an offer of the Dayton Rubber Co., Dayton, O., U.S.A., to survey conditions in Pakistan and to submit a blueprint for a factory with daily capacity of 600 tires and 600 tubes.

A trade agreement has been signed at New Delhi between India and Finland whereby India undertakes to supply various goods, including tires and tubes.

Rubber goods to a value of about $160,000 will also be supplied by India to Egypt under a one-year trade agreement.

EDITORIALS

Rubber Policy Again a Major Problem

INDUSTRY and government leaders are again confronted with the problem of what the long-term policy on rubber for the United States will be. The Rubber Act of 1948 ends on June 30, 1950. The President is scheduled to make recommendations to Congress for new legislation on January 15, 1950, and a Task Committee is preparing suggested recommendations based on answers obtained from the questionnaire sent out by the White House on July 15, 1949.

Unfortunately, these recommendations are being prepared with considerable difficulty since agreement within the industry as well as the government on basic issues is not much better now than it was two years ago when the Rubber Act of 1948 was being formulated. There is danger in this situation since, unless these differences are resolved, the legislation enacted in 1950 may again be of a "temporary" nature and lacking in direction.

It seems hardly possible that nearly five years after the end of the late war we still are unable to decide on a definite and clear-cut national rubber policy, particularly with respect to synthetic rubber, without which that war might not have been won.

As P. W. Litchfield stated recently, rubber is the mainspring of our American economic machine, and this machine cannot function without it. Since we must obtain our *natural rubber* from half-way around the world and since we can never be absolutely sure that this source of supply will always be available to us, continued production and use and research and development on *synthetic rubber* is the cornerstone on which United States rubber policy must be built.

Equally important as part of the foundation of this rubber policy is a rotating stockpile of at least 750,000 tons of natural rubber, to be maintained at all times.

The third major requirement of our rubber policy in 1950 is the consolidation of all government activities in rubber in one central agency. The Rubber Act of 1948 stated that "The President, insofar as practical, shall consolidate all of the powers, functions, and authority contained in this Act in one department, agency, officer, Government corporation, etc. . . ." No real action along these lines has been taken. Inter-agency committees have been used in an attempt to centralize the administration and planning of the rubber program, but majority agreement on important points has been difficult to obtain by this method.

All of these primary policy requirements involve our national security and therefore must remain as responsibilities of the Federal Government. The industry will of necessity, however, have to act as a watchdog to insure proper performance of these government functions. The Rubber Manufacturers Association is at present forming an industry advisory committee on rubber legislation. This committee might well be a permanent one.

Earl W. Glenn, director, Rubber Division, Department of Commerce, speaking before the Washington Rubber Group on November 22 emphasized by means of photographs taken at Ordnance Department supply depots in Europe near the end of the war that as far as military rubber was concerned, we did not do quite so well as we thought at that time. Hundreds and thousands of tire and tank bogie rollers and tracks failed prematurely owing to cracking and chipping. What assurance do we have that these problems are now solved? In another emergency we will most likely have to depend on synthetic rubber to as great an extent as we did in the last war.

It has been demonstrated that "research is the price of progress" in rubber or almost any other field. In order for research to be effective, problems in the national security category in rubber should be integrated and correlated, and this aim can only be accomplished if the rubber program is handled by one central agency. In this way overall planning, stockpiling of natural rubber, production and use of synthetic rubber, plant disposal and maintenance, and research and development can all be seen and administered with a broad perspective.

India RUBBER WORLD has always been a strong supporter of proposals for an American Rubber Research Institute supported by the industry itself for carrying on fundamental research. There need be no conflict between research carried out by the government and that carried out by industry. Drs. A. T. McPherson and L. A. Wood, of the National Bureau of Standards, point out in our November issue in a letter on the subject of the American Rubber Research Institute that "the amount of research on rubber that can be done with profit to both industry and the public is so great that, even if both the institute and the government laboratories should operate in the same general areas, there need be no overlapping or conflict."

We strongly urge that a definite long-term rubber policy, including the three major requirements outlined above, be the goal of industry and government for 1950.

Season's Greetings

AS WE prepare to round out the first half of the Twentieth Century and embark on the second half, India RUBBER WORLD extends to its many friends in the rubber, plastics, and associated industries Best Wishes for a Very Merry Christmas and a Happy and Prosperous New Year.

Both the rubber and the plastics industries have made phenomenal progress, particularly during the last ten years, and there is every reason to believe that this progress will continue at an accelerated pace if we are permitted to enjoy the blessings of peace for an extended period.

DEPARTMENT OF
PLASTICS TECHNOLOGY

Molding of Polythene [1]

K. J. Persak[2]

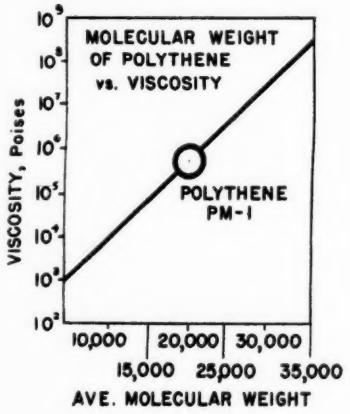


Fig. 1

POLYTHENE is a generic name originated by Imperial Chemical Industries, Ltd., and adopted by du Pont to define those polymers of ethylene suitable for use in plastics. The solid and semi-solid polymers included under this generic name may be further described as substantially saturated chain hydrocarbons of which the average individual molecules are formed from about 100 or more ethylene units. The term "polythene" therefore covers a series of polymers of ethylene of various average molecular weights.

This paper is concerned with polythene of the type and grade known commercially as du Pont's PM-1, which has an average molecular weight of about 18,000 (see Figure 1). Materials of lower molecular weight are being offered commercially for paper coating and specialty applications; while materials of higher molecular weight are being evaluated in the laboratory.

[1] Presented before New England Section, Society of the Plastics Industry, Inc., Manchester, Vt., Oct. 14, 1949.
[2] Plastics department, E. I. du Pont de Nemours & Co., Inc., Arlington, N. J.

Properties of Polythene

It would seem worth while further to characterize this PM-1 polythene by reviewing some of its outstanding properties. Polythene has excellent electrical properties. Its dielectric constant and power factor are very low and remain constant over a wide range of frequencies (see Figure 2). The variation in dielectric strength of compression molded polythene with respect to thickness is shown in Figure 3. Since polythene has very low moisture absorption (0.01%), its electrical properties are practically unaffected by changes in humidity or by immersion into water.

From a chemical viewpoint, polythene is unusual in its insolubility and its inertness to chemical reagents. Polythene is substantially unaffected at ordinary temperatures by concentrated hydrochloric and sulfuric acids. Nitric acid has no visible effect on polythene, although on prolonged contact the concentrated acid does cause impairment of the tensile strength and elongation of the plastic.

As shown in Figure 4, the rate of transfer of water vapor by polythene is extremely low and, of course, is lower in thick sections than in thin. Insofar as rigidity is concerned, polythene is unique. Thick sections can be used as rigid members in designs, although the material is flexible in thin sections. Under no load polythene retains its form stability at temperatures up to about 200° F. In addition to these properties, polythene requires no plasticizer and is the lightest in weight of all commercial plastics. It can be seen, therefore, that polythene possesses properties that attract a greater number of applications.

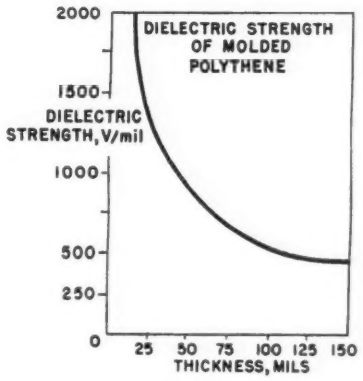


Fig. 3

Molding of Polythene

Our experience indicates that polythene is relatively easy to mold. The material has a wide molding range, excellent flow properties, and is not sensitive to moisture. Its wide molding range provides a means of varying molding conditions to obtain the desired results. Its excellent flow properties permit the molding of thin sections, and, because it does not absorb moisture, no drying facilities are required.

Polythene is supplied in the form of ⅛-inch cubes. It has a low bulk factor, approximately 2.0, and has desirable feeding characteristics for use in an injection molding machine. Polythene can be molded in any commercial injection machine as supplied by the manufacturer. The wide molding range of the material, however, does not imply that variations in cylinder temperature can be tolerated. To obtain maximum machine production, good control of injection cylinder and mold temperatures and injection pressure is imperative.

Effect of Mold Design

The mold design should be such as to permit both halves of the mold to be cored for circulating fluids so that controlled

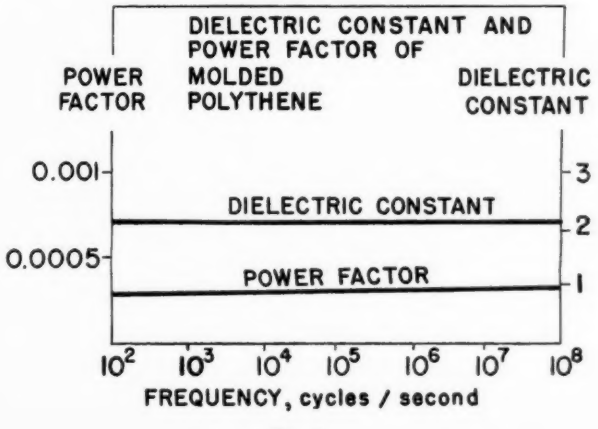


Fig. 2

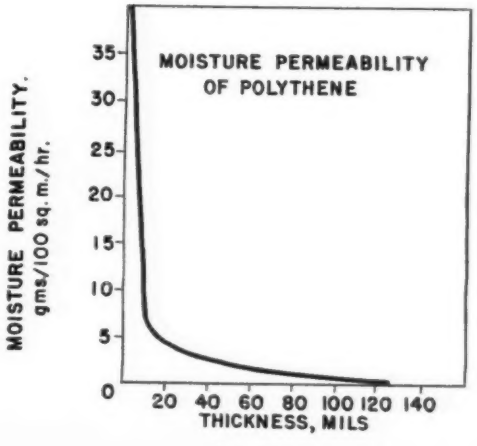
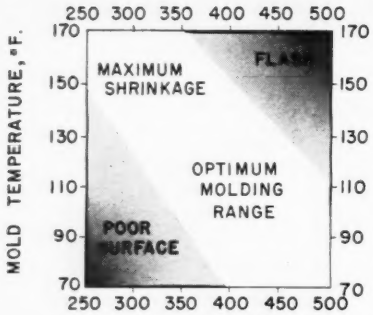


Fig. 4



COMBINATION OF FACTORS AFFECTING MOLDING OF POLYTHENE

Fig. 5

temperatures of 70-180° F. can be maintained at the cavity surfaces. The fluidity of polythene at 400-500° F. requires that the mold be designed and constructed to minimize flash. The molding of dissimilar articles in one mold and use of unbalanced mold layouts should be avoided if possible. The mold should be designed so that a pressure of three to five tons per square inch of projected area will be available to clamp the mold during the injection stroke.

The fluidity of polythene at 450-500° F. makes it possible to mold sections 0.025-inch in thickness, but the material's flexibility in such thin sections influences the design of the knockout mechanism. Each design, of course, must be adapted individually, but in molding one article such as a test tube it is generally better to pull or blow it from the mold, rather than attempt to push it and possiby cause buckling. To facilitate molding at the lowest injection pressures, the cavities should be adequately vented.

Molding Conditions

The technique applied in molding polythene must be tempered by the design of the mold and the article and the requirements of the molded article. By requirements we mean the relative importance of the various factors that should be considered in the molding of polythene, such as mold shrinkage, flash, quality of molded surface, ease of ejection from the mold, and molding cycle. A consideration of these points will determine the optimum mold temperature, injection temperature, and injection pressure.

In general, the best molding conditions are established by using a mold temperature of 70-110° F. Operating at higher mold temperatures usually increases flash and shrinkage, makes ejection from the mold more difficult, and lengthens the molding cycle. A suggested temperature range for the material in the injection cylinder is 350-450° F. Operating below this range may allow unmelted particles of resin to appear in the molding. At temperatures higher than this range, flashing or sticking of article in mold may occur.

Instrument settings will depend on the rate of plastifying. If surface quality is of importance, it must be remembered that the poorest surface is obtained at low mold and injection temperatures.

Combining the consideration of shrinkage with the factors of mold and injection temperature, we find in Figure 5 what might be called the optimum molding range. Minimum shrinkage is found in the lower right-hand corner of the figure, but its accompanying increase in cycle length makes this area undesirable. In establishing a cycle on a mold, any large change in cylinder temperature should be accompanied by a check on the nozzle adjustment. This is usually necessary to compensate for the thermal expansion of a heating cylinder resulting from a change of 200-200° F. in its temperature.

Injection pressure must be balanced with the conditions of mold and cylinder temperatures. Variation in injection pressure will cause erratic shot-to-shot flashing difficulties that are easily differentiated from flash caused by gradual changes in mold or injection cylinder temperatures. Excessive vibration of the injection machine can also cause variations in the feeding of material into the cylinder. This condition gives changes in injection pressure and causes rejects owing to short shots or flash. Sprues and runners can be reground and molded very satisfactorily, but the bulk factor should be kept low to facilitate feeding.

Mold Shrinkage

Our work on the prediction of shrinkage, both in the laboratory and in the field, indicate that a sample mold should be made prior to actual production work, if at all possible. We made a laboratory investigation to determine the effort of molding conditions upon the shrinkage of polythene. As a result of this study, made on a variety of shapes, the following observations were made:

(1) The minimum shrinkage of PM-1 polythene is about 0.010-inch/inch. The molding conditions making for minimum shrinkage are low die temperature, high injection temperature, and high injection pressure. A hot die and low injection temperature and pressure caused an increase in shrinkage to 0.030-inch/inch.

(2) Mold temperature is an important factor in shrinkage. An increase of 20° F. in die temperature increases shrinkage by 0.001-inch/inch.

(3) Injection temperature is also an important factor in shrinkage of polythene because of the material's wide molding range. A decrease of 30° F. in injection temperature has increased shrinkage by 0.001-inch/inch.

(4) The effect of varying the injection pressure is small; a decrease in pressure of 3,000 p.s.i. increased shrinkage by 0.001-inch/inch.

(It should be noted that the effects of (2), (3), and (4) are additive. If existing conditions permit a decrease in mold temperature and increases in injection temperature and pressure, the advantages gained will be additive (see Figure 6).

(5) No significant change in shrinkage came from varying the rate of injection.

(6) Shrinkage of polythene appears to be complete within 24 hours.

(7) Diametral shrinkage of an edge-gated disk is the same in the direction of flow as in the direction perpendicular to flow.

(8) Successive shots molded under similar conditions will show good conformance with one another. If molding conditions are kept constant a tolerance of 0.002-inch/inch in shrinkage should be maintained easily.

These shrinkage data indicate trends rather than specific effects, but they do illustrate the importance of good control of mold temperature and injection temperature and pressure to minimum variations in shrinkage.

Summary and Conclusions

To sum up, it would seem that the position of polythene in the plastics industry is one of growing importance for two reasons: (1) its chemical, physical, and electrical properties are a challenge to the designer and engineer in a competitive market; and (2) molding techniques and equipment are available with which to achieve maximum machine capacity with relative ease.

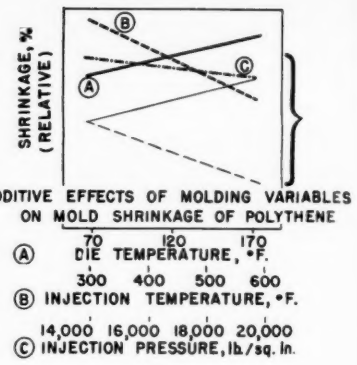


Fig. 6

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(1) "Polythene, a New Plastic and a New Material for Packaging," J. W. Shackleton *Modern Packaging*, 20, 130 (1946).
(2) "Polythene: Physical and Chemical Properties," F. C. Hahn, M. L. Macht, D. A. Fletcher, *Ind. Eng. Chem.*, 37, 526 (1945).
(3) "Mold Shrinkage of Du Pont Plastics in Injection Molding," Du Pont interim report, July 6, 1949.

New "Teflon" Developments

NEW forms of "Teflon" tetrafluoroethylene resin, which for the first time enable the chemical, electrical, and other industries to take full advantage of the material's extreme resistance to chemical corrosion and high temperatures, have been announced by E. I. du Pont de Nemours & Co., Inc., Wilmington 98, Del. Although not yet in commercial production, the new forms of Teflon are regarded as a major development since the plastic has been difficult to fabricate, and relatively simple shapes of limited industrial application have been made heretofore by slow and costly methods.

It was recently discovered by du Pont that "Teflon" could be made as a suspensoid, a form in which fine particles of the plastic are held suspended in a liquid. This discovery led to two equally important discoveries: how to make "Teflon" adhere to metals, and how to make finishes that could be sprayed. From this new "Teflon" suspensoid five new finished product developments have been made: (1) industrial finishes which may be applied by paint spraying equipment to metals and thus can be used for corrosion resistant tank linings; (2) enamels for insulating fine wire which can be coated at a rate of about 500 feet a minute on standard wire coating machinery; (3) compounds for extruding heavier "Teflon" insulation on to wire at rates upward of 20 feet a minute, as compared with the present rate of six feet an hour; (4) unsupported "Teflon" film of improved quality and in thinner gages; and (5) glass fabrics coated with "Teflon". In addition the suspensoid is offered by du Pont as a raw material which will find many other uses. Experience to date with the new "Teflon" forms has been confined to the laboratory, but field development work is now under way.

SPE Quality Control Program: Sections Hold Technical Meetings

THE Quality Control Subcommittee of the Professional Activities Committee of the Society of Plastics Engineers, Inc., held its regular semi-annual meeting on October 12 at the Builders Club, Chicago, Ill. The subcommittee is headed by Jerome Formo, Minneapolis-Honeywell Regulator Co., and is composed of Marion Arthur, Humble Oil & Refining Co.; Dale Amos and Fred Tulley, both of Amos Molded Products; Wm. Hess, Anesite Corp.; Wm. Graves, Western Electric Co.; Don Greb, Minneapolis-Honeywell; and Louis Walter, General American Transportation Co.

The subcommittee has outlined a five-part program of activity, as follows:

(1) Create an interest in quality control in the plastic industry. This work should begin with the molding people and then be extended to the materials field.

(2) Collect examples of the successful use of quality control in this industry. These data should be correlated and divided into major divisions such as dimensional control, surface finish, color, and other characteristics.

(3) Integrate data on suitable quality acceptance levels by means of fine, medium, and coarse dimensional tolerances. Activities should be coordinated with measurement standards groups to establish standard means of measurement. Present visual standards of finish must be supplemented by accurate measurement in numerical terms.

(4) Ascertain the monetary value of quality control in establishing practical design tolerances and inspection standards and in controlling scrap rate.

(5) Publish a quality control manual for use in plastics molding with established standards in such form as to make it possible for shop foremen to put quality control practices into effect in their plants.

Great emphasis was laid on the need of additional members of this subcommittee as it is felt that membership should be expanded to at least 25 so that individual problems may be assigned to two or more members at the same time. Interested persons, either SPE members or non-members, are urged to write Mr. Formo, Minneapolis-Honeywell Regulator Co., 2753 Fourth Ave., S. Minneapolis, Minn.

Thomas and Goss Address Newark Section

Approximately 75 members and guests of the Newark Section attended a regular dinner-meeting on November 9 at the Military Park Hotel, Newark, N. J. Speakers at the technical session were Islyn Thomas, Thomas Mfg. Co., who discussed the "European Plastics Industry," and Wyman Goss, General Electric Co., whose subject was "Some Recent Phenolic Developments."

Mr. Thomas gave his impressions of European plastics conditions gained on a recent trip to the Continent. The speaker noted that the principles of mass production and volume distribution have not yet been accepted by European plastics molders, and he believes that within a few years Italy will be able to produce enough plastics items to fill all her needs.

Mr. Goss gave an interesting review of developments in phenolic molding materials during the past 10 years. Particular emphasis was placed on rubber-phenolic blends with wood flour, cotton flock, fabric, and asbestos. The improved impact strength of these compounds is expected to make them suitable for many industrial applications, particularly in the field of communications, Mr. Goss declared.

Fastening Devices for Plastics

The New York Section held another successful dinner-meeting on November 16 at the Hotel Shelburne, New York, N. Y., with approximately 60 members and guests in attendance. Featured speaker at the technical session was Walter A. Toepel, Parker-Kalon Corp., who discussed "Fastening Devices for Plastics."

Mr. Toepel's talk covered self-tapping and drive screws and their applications in fastening plastic parts to one another or to other materials. The different types of screws made by Parker-Kalon were described, and details given on screw hole dimensions and design, methods for driving screws, screw materials and finishes, and related topics. Mr. Toepel illustrated his talk with diagrams of the different types of screws and examples of typical applications in the plastics field. The talk was received with interest and was followed by a lively discussion period.

In the business session preceding the talk, Section President Stanley Bindman, Noma Electric Corp., announced the formation of the following committees:

1951 SPE National Conference Committee: Mr. Bindman, chairman; Saul Blitz, Noma Electric; G. P. Bohrer, Ideal Plastics Corp.; H. W. Cyphers, American Cyanamid Co.; N. V. Fasano, Washington Molding Co.; A. L. Ge Wertz, consultant; Sam Gurley, Chemical Division, Borden Co.; G. P. Humphrey, consultant; A. S. Jacobs, Renwal Mfg. Co.; C. W. Kleiderer, Ideal Plastics; A. M. Merrill, India RUBBER WORLD; Herbert Proske, Wheelco Instruments Co.; G. H. Rice, American Cyanamid; Sam Silberkraus, consultant; and B. E. Wessinger, Wess Plastic Molds, Inc.

Employment Clearing House Committee: Mr. Jacobs, acting chairman; Messrs. Silberkraus and Humphrey; and Carl Birkmaier, Dow Chemical Co.

Nominating Committee for new directors: B. A. Boucher, Durite Division, Borden Co.; F. C. Meacham, Northern Industrial Chemical Co.; Mr. Merrill; H. A. Wachtel; and Sidney Zweier, Noma.

Committee of "Experts" to answer questions from the members: compression molding, Mr. Silberkraus; injection molding, Mr. Wachtel; mold making, Mr. Wessinger; thermosetting materials, W. A. Ward, American Cyanamid; thermoplastic materials, Ralph Hayes, Gering Products, Inc.; and assembly and finishing, Mr. Bindman.

Section officers for the coming year were elected by the directors at their last meeting, as follows: president, Mr. Silberkraus; vice president, Mr. Humphrey; secretary-treasurer, George Baron, Ideal Plastics; and national councilor, Mr. Fasano.

Table favors were distributed through the courtesy of Mr. Wessinger, and the meeting closed with a drawing for door prizes contributed by Durite Division, Borden Co., and Plaskon Division, Libbey-Owens-Ford Glass Co.

Fabric Coating Discussed

A talk on "Plastics in Fabric Coating," by David S. Plumb, Monsanto Chemical Co., featured the November 7 dinner-meeting of the SPE Philadelphia Section. Approximately 34 members and guests attended the meeting, which took place at the University Club.

Mr. Plumb summarized trends in the textile coating industry since the end of the war, emphasizing the increased use of vinyl resins for coating and discussing the relation of these resins to rubber coating and nitrocellulose coating. The four types of coating techniques used for vinyl resins are calendered sheeting, solution spread coatings of polyvinyl chloride and polyvinyl butyral, organosol coating, and paste coating. The operations and advantages of each of these methods were discussed and typical applications given by the speaker.

In the business session preceding the technical talk the election of three new members to the Section's board of directors was announced: Richard D. Bishop, Socony Vacuum Oil Co.; George Koch, Jr., Molded Insulation Co.; and D. I. Yarnall, Rohm & Haas Co., Inc.

DeBell Reports on Japanese Plastics Industry

A talk on "The Japanese Slant on Plastics," by John M. DeBell, DeBell & Richardson, Inc., featured the November 2 dinner-meeting of the Western New England Section, SPE, at the Hotel Sheraton, Springfield, Mass.

Mr. DeBell, who recently returned from an extensive trip throughout Japan, noted that the country seemed very well organized and attributed this fact to the occupation forces. The Japanese organic chemical industry is good, but is hampered by a lack of raw materials and the poor physical condition of the plants. In the plastics field, the speaker said that phenolics are fairly plentiful but expensive, while ureas are good and in wide competitive use. The Japanese compression molding field in general is about 30 years behind that of the United States, as there are no large molds, transfer molding, or preheating in Japan.

The thermoplastic field is quite limited, Mr. DeBell added, noting that he did not see a decent injection molding plant on the whole trip. The chief drawbacks are restrictions on dollar exports and the need of importing all raw materials. The Japanese, however, are working on the replacement of silk with a plastic fiber that has no American counterpart. Although yet to prove any accomplishments in the plastics field, Mr. DeBell said that the Japanese are willing to work and, with help from this country, will develop into a serious competitor.

An interesting discussion period followed the talk, during which the speaker described other aspects of Japanese life and industry. Door prizes were awarded through the courtesy of Rogers Plastics.

Geon for Plating Racks

ELECTROPLATING racks used in copper, nickel, and chrome solutions are first dipped for insulation into Geon plastisols formulated by Michigan Chrome & Chemical Co. Plastisols based on Geon paste resin 121, a product of B. F. Goodrich Co., Cleveland, O., have markedly influenced the dip coating industry. By control of compound viscosity, temperature of the article dipped, and speed of dipping and withdrawal, it is possible to apply coatings with thicknesses ranging from a few mils to ¼-inch or more per dip. The Geon plastisol coatings have given excellent service on the plating racks and, according to Michigan Chrome, will probably outlast the racks themselves.

Scientific and Technical Activities

Pacific Conference on Rubber and Plastics

AN ALL-DAY program on rubber and plastics was sponsored jointly by the Northern California Rubber Group and the San Francisco Section, Society of the Plastics Industry, Inc., as part of the Pacific Industrial Conferences, held November 1-5 at the Civic Auditorium, San Francisco, Calif. The Conferences, consisting of programs by 11 cooperating scientific and technical societies, were held in conjunction with the Pacific Chemical Exposition sponsored by the California Section, American Chemical Society.

The rubber and plastics program, held on November 4, included nine technical papers, a banquet and after-dinner speaker, and a panel discussion. Approximately 200 attended the technical sessions; while 140 were present at the banquet.

H. J. Jordan, E. I. du Pont de Nemours & Co., Inc., presided over the meetings and in his opening remarks noted that the meeting was the first in that area in which rubber and plastics groups had combined to promote better understanding between producers and users of various items for the common good.

Leonard K. Firestone Addressing the Banquet Guests, with H. J. Jordan, Program Chairman for the Rubber and Plastics Part of the Conferences, at His Left

Others at the Speakers' Table at the Rubber and Plastics Banquet, Pacific Industrial Conferences: (*Left to Right*) Neil McIntyre, Oliver Tire; George B. Farwell, Goodyear Rubber Co.; R. J. Clausen, Pioneer Rubber; W. J. Haney; H. A. Wright, Pacific Rubber Co.; Dickson Sheppard, Goodyear Tire & Rubber Co.; Mrs. and Mr. R. E. Hutchinson; Ira Williams; W. D. Good; H. R. Mansfield, Pioneer Rubber; R. B. Stringfield; Mr. and Mrs. F. T. Kebely; Earl Boos, Pacific Rubber Co.; J. A. Liljegren, Pioneer Rubber; R. D. Kettering; R. J. Henderson, American Rubber Mfg. Co.; and R. R. James, Mare Island Naval Shipyard Rubber Laboratory

Technical Papers Presented at Afternoon Session

Seven technical papers were presented at the afternoon session, as follows: "Engineering of Rubber Products for Industrial Needs," W. D. Good, American Rubber Mfg. Co. and chairman of the Northern California Group; "The Outlook for the Rubber Business in the Inter-Mountain and Pacific Areas," F. E. Schluter, president, Thermoid Co.; "The Recapping Materials," G. F. Oliver, president, Oliver Tire & Rubber Co.; "Plastics (A Plastic Business)," H. Norman Eierman, Remler Co.; "Plastics (Industrial Applications)," Ferdinand T. Kebely, K-Plastix; "Plastics (Vinyl Plastics Invade the Rubber Field)," G. A. Fowles, B. F. Goodrich Chemical Co.; and "Applications of Neoprene and 'Cold Rubber' in Electrical Cable," Gene Huxley, Western Insulated Wire, Inc.

Mr. Good discussed methods by which the rubber technologist can help the consumer in the proper engineering of rubber products for his industrial needs. To develop a rubber item, the following steps should be observed: (1) establish a cooperative attitude between the consumer's engineering department and the rubber technologist's; (2) determine the properties desired in the rubber item and list them in order of importance; (3) supply the rubber technologist with a complete description of the service application; and (4) perform laboratory and service tests to establish the suitability of the rubber item. Mr. Good stated that the size and the design of the mold often have more effect on the cost of the rubber item than any of the other factors involved and emphasized that the consumer should always consult with the rubber technologist before making a mold.

Mr. Schluter stated that business depends on conditions locally, nationally, and worldly. He analyzed world conditions as being worse for the American businessman owing to decreased exports, devaluation of foreign currency, and lowered tariffs. On the national outlook, the speaker expressed the opinion that the current recession has not yet run its course, and he does not foresee much improvement until labor questions are resolved. On the local outlook, Mr. Schluter said that business will be better because of increased population and expansions in the food, housing, mining, oil, and automotive industries which should be reflected in a greater demand for rubber goods. He further declared that the western trend toward business decentralization, higher per capita buying power, better labor-management relations, and progressive attitude all favor business conditions.

Mr. Oliver began his talk by noting that from 1937 to 1941, 25% of tire replacements were recaps; from 1941-1945, 56% were recaps; from 1946-1948, 15% were recaps; and for 1949 it appears that 20% of replacements will be recaps. Since the average tire consumes about three to five pounds of recapping material, 20,000,000 pounds of recapping materials will be sold during 1949. After describing the production of camelback from GR-S, "cold rubber," and natural rubber, the speaker said that recapped tires of either GR-S or natural rubber consistently outwear new tires because of the necessity of using a different type of tread compound on new tires to compensate for normal tire growth. Camelback made from "cold rubber" is more expensive than other types, but the cost is more than offset by the increased quality. Mr. Oliver concluded his talk by listing five points to check when selecting a recapper: (1) determine the modernity of the shop and its equipment; (2) find out who else has had his tires recapped by the firm; (3) find out what kinds of recapping materials and how many different brands are being used by the firm; (4) determine which rubber will be used on your tires and why it will be used; and (5) determine that the recap depth is thicker than the depth of tread markings.

Mr. Eierman described the relative growth and status of the thermoplastic and thermosetting plastics industries and stated that only large-volume production of a plastic item is profitable. This large volume is required for reasonable amortization of the large tooling cost for each new item. The best procedure for the development of a new item is to make a sample die for a few thousand units to determine marketability before justifying the manufacture of a production die.

In his talk Mr. Kebely stated that the many new plastic materials developed in recent years have created special problems in the plastics industry. At present there are several thousand materials with which to work, each with its own method of processing. The speaker discussed the major fields of application of plastic and noted that their use in product models and demonstration is a new use just now getting under way.

Mr. Fowles declared that the 200,000,000 pounds of vinyl plastics which will be produced this year will replace rubber in many fields. The principal features of vinyls which make their bid for use over rubber are flame resistance, toughness, easy processability, and chemical resistance. The rubber industry was slow to accept vinyls because of their high cost and apparent restriction in use to wire insulation. Because of this hesitancy the production of vinyl films, extruded articles, and spreading applications were taken over by other processors. The ease of processing of the vinyls offsets to a large extent their initial high material cost and thus places them in a competitive position to rubber. Mr. Fowles also showed slides and films of products

where vinyl plastics have invaded the rubber industry, including garden hose, films, upholstery, wire insulation, dolls, phonograph records, floor tiling, and others.

Mr. Huxley gave the principal causes of failure of electrical cable as failure of the copper conductor due to flexing, failure of the wire insulation due to either flex cracking or abrasion, and failure of the jacket due to abrasion, sunlight exposure, or chemical attack. The speaker stated that "cold rubber" has been found ideally suited for wire insulation because of its high tensile strength, and properly compounded stocks can take a partial cure without blowing. This latter characteristic is especially valuable in reducing bumping operations during fabrication. The desired finished cure is then obtained during jacketing operations. Natural rubber wire insulation overcures under the same conditions. Mr. Huxley said that neoprene jacket compounds give the best all-around protection to cables and is in greater use than GR-S or natural rubber in jackets because of its excellent resistance to sunlight, oils, aging, flame, abrasion, tearing, chipping, and cutting.

Leonard Firestone Banquet Speaker

The highlight of the program was the evening banquet at the Hotel Whitcomb, with Leonard K. Firestone, president of Firestone Tire & Rubber Co. of California, as after-dinner speaker. Mr. Firestone's topic was "The New Day in Rubber," and he began by tracing the development of synthetic rubber from its beginnings to the present time, showing how the high price of natural rubber practically forced this development. The development of "cold rubber" was also described together with its advantages as compared to standard GR-S. Mr. Firestone predicted that the use of synthetic rubber will increase. At present 40% of all new rubber consumed is synthetic, despite the restriction of the foreign market owing to dollar shortages and the improved competitive position of natural rubber resulting from foreign currency devaluation. This country, however, has attained national self-sufficiency through its synthetic rubber program, Mr. Firestone concluded, and the price of natural rubber has been stabilized.

Program of Evening's Technical Session

The evening session following the banquet consisted of a talk on "'Cold Rubber' Compounding and Processing," by Dickson M. Sheppard, Goodyear Tire & Rubber Co., and a panel discussion. Mr. Sheppard stated that the compounding of "cold rubber" is practically the same as for GR-S except that about 5% more acceleration is required. The properties of "cold rubber" excell those of similar GR-S stocks, and its tensile strength is about equal to that of natural rubber although its ultimate elongation at high temperatures is inferior. The flex life of "cold rubber" is better than that of standard GR-S, but inferior to that of natural rubber. "Cold rubber" is not the equal of natural rubber in resilience and heat build-up. On the basis of equivalent loading, the roadwear of "cold rubber" compounds is 23% better than that of GR-S compounds and about 15% better than that of natural rubber compounds. Tread cracking properties of "cold rubber" are better than those of GR-S, but inferior to those of natural rubber. "Cold rubber" is inferior to both GR-S and natural rubber in sidewall cracking and is no better than GR-S in skid resistance on icy roads. Mr. Sheppard further stated that the processing of "cold rubber" does not appear to present too much of a problem. Shorter mixing times are possible, but scorch problems are somewhat greater, especially with camelback acceleration. It has been found that the work-back of scrap is less of a problem with "cold rubber" than with GR-S. Shrinkage of "cold rubber" is about equal to that of similar natural rubber compounds, and much better than that of GR-S compounds. "Cold rubber" compounds tend to become boardy after cooling and thus cause trouble during fabrication, but their molding properties are satisfactory. Mr. Sheppard expressed the belief that the future use of "cold rubber" would be largely confined to treads for the smaller sizes of passenger-car tires and to camelback.

The panel discussion which climaxed the day's program answered numerous questions from the floor, including those raised as a result of the papers presented during the technical and dinner sessions. The discussion was led by Raymond B. Stringfield, president of Fullerton Mfg. Co., and other panel members were: Richard A. Claussen, Pioneer Rubber Mills; Messrs. Eierman, Fowles, Good, Huxley, Kebely, and Sheppard; William J. Haney, Kirkhill Rubber Co.; R. E. Hutchinson, Firestone; Russel Kettering, Oliver Tire; and Ira Williams, J. M. Huber Corp.

Accompanying photographs of the speaker's table at the banquet are by courtesy of Fred Sawyer, associate editor, *Chemical & Engineering News*.

Los Angeles Panel on Mixing Equipment

A PANEL discussion on "Rubber Mixing Equipment" featured the October 4 dinner-meeting of the Los Angeles Rubber Group, Inc., at the Hotel Mayfair, Los Angeles, Calif. Approximately 65 members and guests heard the discussion by a panel composed of Tway Andrews, H. M. Royal, Inc.; Phil Drew, Goodyear Tire & Rubber Co.; Charles Kuhn, Master Processing Co.; George Miller, W. J. Voit Rubber Corp.; and Paul Oliver, Farrel-Birmingham Co., Inc. Neil Pestal, Firestone Tire & Rubber Co., acted as moderator.

Panel Discussion

Questions submitted to the panel and the answers given follow:

Q. 1. What is the comparative effectiveness of open-end *versus* closed-end mill cooling?

A. (*Mr. Drew.*) Open-end cooling eliminates the possibility of drain back pressure, which usually amounts to 5-10 pounds in the closed-end method. Open-end cooling also allows a more effective spray cooling since the spray pipe can at all times be kept above the level of the cooling water, permitting the sprays to contact intimately the roll surfaces and provide better cooling.

Q. 2. What is the importance of clearance between extruder screw and barrel?

A. (*Mr. Drew.*) If the clearance between extruder screw and barrel is not kept very low, too much stock flows backward over the screw, resulting in loss of production and scorched stock. New machines should be set up with a diameter clearance of 0.001-0.002-inch between screw and barrel. Tubing machine clearance should be reduced when it exceeds 0.006-inch in diameter between screw and barrel.

Q. 3. What is the best method for keeping scale off the inside of mill rolls?

A. (*Mr. Miller.*) The best method, of course, is to soften or treat the cooling water. Softening plants require a considerable outlay of money for original equipment and also for maintenance. Calcium and magnesium scaling can be prevented by dosing the water with a sequestering agent, such as sodium pyrophosphate. Here, the cost of equipment is quite nominal, and with water of medium hardness the cost of the sequestering agent would amount to only a few cents per 100 gallons of water treated. To be economical this method would require a closed-circuit water system. "Stars" or "jacks" are often placed inside the rolls. These are irregularly shaped pieces of iron which scour out the scale as the roll turns and tumbles them around. If stars are used, the inside of the roll should be inspected frequently to insure that the stars do not group together and score the roll. Rolls have been known to fail at such score points. Probably the most acceptable method is to dissolve out the scale at frequent intervals by means of an inhibited acid. Such an acid is available from reputable manufacturers who will recommend the proper acid and equipment for the job. An acid circulating system with pump, tanks, and accessories is easily and cheaply built, and the method for removing scale is simple, safe, and economical.

Q. 4. On an open mill, what is the most practical mechanical device for automatically returning to the bank any powder that falls through the mill rolls?

A. (*Mr. Miller.*) The best device for returning powders to the bank is an apron consisting of an endless belt which runs into the mill pan and back up over the roll. The belt is usually as wide as the rolls are long so that it picks up all powder droppings and returns them to the bank. The belt is driven by friction contact with the rolls and may be raised and lowered by means of a pneumatically operated cable. It is kept in a lowered position while the mill is being loaded and, as droppings accumulate, is raised to the roll contact position. Mill aprons may be purchased as standard equipment from any of the mill manufacturers.

Q. 5. Discuss the types of dust rings used on Banburys, with reference to pigment loss and tailings.

A. (*Mr. Oliver.*) A number of different type dust stops have been used, with the most successful at present being types "D" and "F". The type "D" has a floating friction ring which is loosely keyed to the rotor shaft and the seals made by pressure being applied to a bronze gland ring which forces the friction ring against the collar on the end frame ring. The type "F" stop has a hardened collar which is shrunk on the rotor shaft and extends through the end plate; the seal is made by the dust stop gland ring which presses against the rotor collar by means of spring tension. There is a question as to the relative merits of these two types, with each being preferred by some companies. I believe that either type of dust stop will work successfully if it is properly maintained. Improper spring tension and lack of lubrication are the usual causes of failure of these stops. If the lubricator runs out of oil or fails to supply the proper amount, the oil holes in the gland rings become plugged, thereby allowing the rings to wear and compounds to pass by the

stops. I believe that about 75% of losses around the dust stops can be prevented by proper maintenance of the equipment. The sight glasses on the lubricator should be kept clean at all times, and the lubricator examined periodically. It is also very important that any accumulation of stock around the dust rings be removed to allow them to float freely.

Q. 6. What are the minimum and maximum rotor clearances for Banburys?

A. *(Mr. Oliver.)* The standard rotor clearance between the rotor and shell of a size 11 Banbury is approximately 3/16-inch. Many companies have used the Banbury until the clearance is as much as 5/8-inch without experiencing mixing difficulties. It should be emphasized that as the rotors and sides wear, it is necessary to increase the batch size in order that the floating weight pressure be maintained at all stages of the mix.

Q. 7. What is the best method for handling sticky batches on mills, such as neoprene and high resin containing batches?

A. *(Mr. Kuhn.)* Several methods can be considered, including: (1) use of a cool mill; (2) application to the mill rolls of either an appropriate chemical, sodium silicate (if contamination is not objectionable), or a very fine spray of solvent; (3) suitable compounding; (4) use of a scraper bar; and (5) use of small-size batches.

Q. 8. What is considered normal loss or shrinkage on the average No. 11 Banbury batch?

A. *(Mr. Kuhn.)* Normal loss is approximately 1-2%, and somewhat higher with heavily loaded stocks. Keeping the dust rings and sliding gate in best working condition keeps this loss at a minimum.

Q. 9. Discuss the new state safety regulations.

A. *(Mr. Andrews.)* Although many in the industry believe that there is currently a state safety code which covers stopping distances and other comprehensive features as regards safe mill operation, this is not true. At present very complete general safety orders are being prepared by the California Division of Industrial Safety and should become law within the next year. The proposed rules follow in general the stopping limits of the American Standards Association's Safety Code for Rubber Machinery and specifies such things as location of the trip rods or cables and minimum height of mill rolls. One important change has been made in the proposed rule as regards the latter requirement: on old installations it will be satisfactory to have the top of the front roll no less than 42 inches above the working floor level; whereas new installations require a minimum height of 46 inches.

Q. 10. What are the usual mill ratios, and what are their effects on different types of batches?

A. *(Mr. Andrews.)* As would be expected, there is no uniform agreement among men in the industry as to the best ratio for any particular job. However most seem to agree that ratios as high as 1.5:1, which were commonly used many years ago, are excessive since power consumption is increased and heat softening more pronounced. Ratios of about 1.1:1 are good for feed mills used to feed calenders or extruders. Mills with these ratios maintain the stock plasticity and greatly reduce the tendency to overheat and scorch.

Dinner Session

The afternoon technical session was followed by a social hour and dinner-meeting attended by 165 members and guests. Entertainment was provided by impersonator Bert Henderson, and the meeting concluded with a drawing for six door prizes contributed by the Group. Prize winners were Larry Keltner, B. F. Goodrich Co.; Glen Goes and J. Bremble, both of Kirkhill Rubber Co.; Mason Paine, Firestone; Ernest Brazil, Blue Star Mines, Ltd.; Fred Reiter, Pacific Hard Rubber Co.; and W. E. Ostman, a guest.

Lectures on Rubber Technology

The Group is offering its members an introductory course in basic rubber technology, with a large portion of the cost being underwritten by the Group. The course comprises weekly sessions of three hours extending over 15 weeks and is being given in the laboratories of H. M. Royal, Inc. Classes are conducted by R. B. Stringfield, president of Fullerton Mfg. Co., and F. W. Woerner, chief chemist of L. A. Standard Rubber Co., and include both lecture and laboratory work.

Williams Discusses Rubber Oxidation

The Los Angeles Rubber Group held a regular meeting on November 1 at the Hotel Mayfair, with approximately 161 members and guests in attendance. A talk on "Oxidation and Antioxidants," by Ira Williams, J. M. Huber Corp., featured the afternoon technical session.

Dr. Williams stated that the oxidation of rubber and the combination of rubber with sulfur are similar in some respects. Both oxygen and sulfur combine with rubber at a constant rate until they are nearly consumed. Both oxygen and sulfur probably attack both double-bonds and alpha carbon atoms. Ordinary aging is probably caused by massive oxidation which attacks alpha carbons, the speaker said. This action is promoted by the presence of either combined oxygen or combined sulfur. Flex cracking appears to be a type of massive oxidation; while sun checking and mastication oxidation attack the double-bonds. Antioxidants are not effective against oxidation at double-bonds. Antioxidants probably act as deactivators of combined oxygen or sulfur to reduce the rate of massive oxidation to a rate normal for the rubber hydrocarbon.

The cocktail hour and dinner-meeting following the technical session was sponsored by W. J. Voit Rubber Corp. and was acclaimed as one of the best of the year. An after-dinner talk on "Football," by Mike Pecarovich, an outstanding football coach and authority, featured the meeting. The nine door prizes, contributed by Voit, were won by the following: W. E. Shawger, California Rubber Products, Inc.; D. W. Burson and Joe Sheets, both of H. M. Royal, Inc.; Joe Hoefle, Plastic & Rubber Products Co.; Montel Montgomery, Martin, Hoyt & Milne, Inc.; C. E. Daniels, Shell Oil Co.; C. A. Carlton, Huber Corp.; and S. P. Atkinson and B. Moeller, both of Kirkhill Rubber.

National Safety Congress, Rubber Section Meeting

THE Rubber Section of the National Safety Council held two sessions on October 25 and 26 as part of the National Safety Congress in Chicago, October 24-28. T. H. Boyd, Manhattan Rubber Division, Raybestos-Manhattan, Inc., chairman of the Rubber Section, presided at both sessions.

Contest Award Winners, Etc.

At the first session Mr. Boyd made a report of activities of the Section, following which J. L. Dean, Firestone Tire & Rubber Co., talked on outstanding facts in connection with the Rubber Section Safety Contest 1948-49. J. I. Banash, consulting engineer and past president of the N. S. C., then presented the awards.

A total of 115 companies finished the Safety Contest. The number of manhours reported was in excess of 255,000,000, during which time 1,774 disabling injuries were reported. The cumulative rate for all contestants was 5.73, a reduction of 17% from the rate for the previous contest. The average rate of 5.73 was 31% below the national average of 8.35 for all companies in the Rubber Section who reported their experience to the Council in 1948. Eighty-one companies had rates below the national average. Fourteen companies, including one with below minimum exposure, completed the contest with perfect records.

In Division I (average monthly manhours' exposure over 400,000), first place was won by the Firestone company at Memphis, Tenn., with a twelve-month frequency rate of 0.57. Firestone's plant #1 at Akron, O., was second with a frequency rate of 0.81, and United States Rubber Co. plant at Mishawaka, Ind., was third with a rate of 1.01.

In Division II (exposure between 100,001 and 400,000) first place went to the Electric Hose & Rubber Co., Wilmington, Del., with a 0.55 frequency rate; Dominion Rubber Co., Ltd., St. Jerome, Canada, was second with a 0.86 rate; and U. S. Rubber at Indianapolis, Ind., was third with a 1.18 figure.

In Division III (exposure between 50,001 and 100,000), General Tire & Rubber Co., Baytown, Tex.; U. S. Rubber, Naugatuck, Conn.; Van Cleef Brothers, Inc., Chicago, Ill.; and U. S. Rubber Reclaiming Co., Inc., Buffalo, N. Y., headed the list with perfect records.

Similarly, in Division IV (exposure under 50,000 manhours), Firestone's synthetic division at Akron; McCreary Tire & Rubber Co., Indiana, Pa.; Firestone's, Akron research laboratory; Canadian Lastex, Ltd., Montreal, P.Q., Canada; B. F. Goodrich Co., DuBois, Pa.; U. S. Rubber, Burlington, N. C.; Goodyear Tire & Rubber Co., Niagara Falls, N. Y.; Fabric Fire Hose Co., Sandy Hook, Conn.; and Lobl Mfg. Co., Middleboro, Mass., all finished the contest with perfect records.

The next part of the program was a representation of the revised Safety Code for Rubber Mills and Calenders, B-28.1 of the American Standards Association,[1] by Ernest W. Beck, U. S. Rubber.

A panel discussion on "Protection of Fabric Windups and Letoffs" was held with R. W. Fickes, Goodyear, as discussion leader. Participants were Thomas J. Cain, Jr., Goodrich, and Wesley M. Graff, U. S. Rubber.

New Officers and Second Panel Discussion

At the second session on October 26

[1]See India RUBBER WORLD, Nov., 1949, p. 202.

Hot Tips on Cold Rubber:

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the chairman of the nominating committee, R. A. Bullock, Corduroy Rubber Co., Grand Rapids, Mich., made his report, which was followed by election of officers for the 1949-50 period.

The new general chairman of the Rubber Section is H. L. Andrews, Firestone, Akron. Vice chairman in charge of program is S. A. Wright, Inland Mfg. Division, General Motors Corp., Dayton, O.; and secretary is George Burkhardt, General Tire, Akron.

News Letter editor is R. M. Boyles, Midwest Rubber Reclaiming Co., East St. Louis, Ill.

T. J. Cain, Jr., Goodrich, Akron, is chairman of the engineering committee, with Mr. Graff, and W. J. Dooling, Hood Rubber Co. Division, as members.

M. E. Badstuber, Ohio Rubber Co., Willoughby, O., is chairman of the trade association and liaison committee.

The health committee is headed by F. W. Sands, U. S. Rubber, with Dr. R. H. Wilson, Goodrich, and F. S. Malette, Firestone, as members.

C. E. Beck, St. Clair Rubber Co., Detroit, Mich., heads the membership committee; while J. L. Dean, Firestone, heads the publicity committee.

The poster committee consists of L. F. Nixon, Canadian Synthetic Rubber, Ltd., chairman, and G. A. Miller, Gates Rubber Co., Denver, Colo.

The statistics committee is headed by J. J. Raytkwich, Naugatuck Chemical Division, U. S. Rubber.

Members at large include the following past chairmen: Messrs. Beck, Bullock, and Boyd, G. D. Cross, Firestone, R. S. Farnum, O. Hopkins, Roland Kastell, and J. E. Lovas, all of U. S. Rubber, C. F. Horan, Arrow Mutual Liability Insurance Co.; J. M. Kerrigan, U. S. Rubber Reclaiming; W. L. Schneider, Goodrich, and P. Van Cleef, Van Cleef Brothers; and Dr. J. Newton Shirley, Arrow Mutual.

The program was concluded with a symposium and panel discussion on "Visual Aids in the Rubber Industry Safety Program." Mr. Wright acted as discussion leader.

Papers entitled "Materials Available from the National Safety Council" by E. P. Marconi, of the N. S. C.; "Materials Available from Other Sources" by C. F. Scheer, Zurich General Accident & Liability Insurance Co.; and "Materials Which You Can Develop" by H. L. Andrews, of Firestone, were presented as part of the symposium program.

Plant Maintenance Show

MANY subjects of interest to the rubber industry will be on the program for discussion at the first Plant Maintenance Show, to be held in the Auditorium, Cleveland, O., on January 16-19. The exposition, to be held concurrently with a four-day conference, is the first ever devoted exclusively to maintenance. The program, sponsored jointly by the American Society of Mechanical Engineers and the Society for the Advancement of Management, will include such topics as "Maintenance Organization and Management," Budgeting the Maintenance Operation," "Upkeep of Motors, Controls, and Distribution Equipment," "Lubrication," "Application of Service Equipment," and many others. The exposition will consist of more than 100 exhibits demonstrating the use of machinery, materials, and methods for reducing costs in plant maintenance.

Government Trends Discussed

A TALK on "What's Cooking in Washington Today," by Paul R. Leach, chief of the Knight newspapers' Washington bureau, featured the fall meeting of the Akron Rubber Group. Attended by some 300 members and guests, the meeting was held on October 28 at the Mayflower Hotel, Akron, O.

In an interesting talk which was followed by a long question and answer period, Mr. Leach gave inside opinions on many of today's controversial issues. Tire men in the audience were pleased to hear the speaker express the opinion that excise taxes on tires, as well as on travel and communications, will probably be reduced next year. Income taxes will not be raised because 1950 is an election year, Mr. Leach said, and also predicted that President Truman will seek reelection in 1952. The speaker stated flatly that the United States has become a welfare state, with the only question being how far we are going with the welfare programs. The speaker also gave the opinion that there is little chance for Congressional approval of the compulsory health insurance plan proposed by the President, universal military training, standby authority for the President to impose price controls and rationing, and repeal of the Taft-Hartley Act.

The Group's winter meeting, to be held at the Mayflower Hotel on February 3, will feature a symposium on new developments in rubber machinery. Details will be announced at a later date.

Tyson on "Synthetic Fuel"

THE Chicago Rubber Group held its fall meeting on November 4 at the Morrison Hotel, Chicago, Ill. Approximately 186 members and guests of the Group attended the meeting, which included a cocktail hour and dinner and featured a talk on "Synthetic Fuel" by C. W. Tyson, Standard Oil Development Co.

Mr. Tyson described the theoretical and practical aspects of the development of processes for the manufacture of synthetic gasoline and fuel oil from natural gas, coal, and oil shale. The program which Standard Oil Development has undertaken to investigate the economic possibilities of production from each of the three sources of raw material was summarized, and comparative cost estimates were given for building a plant and producing gasoline by each method. Indications are that based on present knowledge it should be possible to make synthetic gasoline for 5¢ a gallon over the cost of gasoline from petroleum. Further research and development under way may lower the cost by the time such a process is needed because of depletion of petroleum reserves.

In the business session it was announced that J. Frank Taylor, Commercial Solvents Corp., has been elected secretary-treasurer of the Group to fill the vacancy left by the resignation of Maurice O'Connor, who has moved from the Chicago area. Entertainment was provided by a showing of the sound-color film, "Famous Fairways," showing the most famous and difficult golf courses in the country, made available through the courtesy of A. G. Spalding & Bros., Inc.

R. P. Dinsmore, vice president, Goodyear Tire & Rubber Co., will address the February 17 meeting of the Chicago Group on the subject, "Where Do We Stand."

New NBS Appointees

THE National Bureau of Standards, Washington 25, D. C., has announced the appointment of Robert S. Marvin and Richard N. Work to its research staff. Dr. Marvin will conduct investigations into the dynamic-mechanical behavior of rubber-like materials. Samples will be subjected to low-frequency alternating forces, and the magnitude and phase angle of the resulting displacements measured. Such measurements should assist in the interpretation of rubber-like behavior in terms of molecular structure and aid in evaluating such materials for use in devices for vibration insulation. Dr. Marvin received a Ph.D. in physical chemistry from the University of Wisconsin, where he was a project associate before coming to the Bureau.

Dr. Work will investigate and analyze the dimensional changes in natural and synthetic rubbers under changing temperatures. Particular attention will be paid to the second-order transition temperature and its relation to the constitution of rubber. Dr. Work is a graduate of Cornell University and was previously a teaching assistant and research associate at the university. He did fundamental work on the dynamic properties of rubber and rubber-like materials, developing apparatus and techniques for measuring the elastic losses in rubber samples under small amplitude torsional vibrations.

Kenflex Price Reductions

THE prices of Kenflex resinous hydrocarbon plasticizer products have been substantially reduced, according to the manufacturer, Kenrich Corp., New York 5, N. Y. The new prices bring the various Kenflex products to the same level, regardless of melting point or viscosity, and are made possible by expanded production and reduced material costs, according to John Ware, general manager. Kenflex has found wide application because of its inherently good electrical properties, in addition to serving as a processing aid. It is compatible with all synthetic rubbers and synthetic resins such as polyvinyls, polyethylene, polystyrene, cellulose nitrate, etc.

Haggerson Research Medalist

THE 1949 Medal for the Advancement of Research, one of the country's top research honors, went to Fred H. Haggerson, president of Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y. The medal, given annually by the American Society for Metals, was presented to Mr. Haggerson at the Society's annual banquet, held in Cleveland, O., on October 20. Mr. Haggerson was cited as an outstanding example of an industrial leader who has advanced technological progress in broad fields of the metal industries to the ultimate benefit of the consuming public. In his acceptance speech Mr. Haggerson praised the work of the hundreds of research workers in the company's laboratories who, he said, were responsible for the achievements mentioned; he also lauded industry for its research accomplishments.

Ontario Group Hears Chase

A TALK on "Advances in Heavy Rubber and Plastics Machinery," by Donald C. Chase, Farrel-Birmingham Co., Inc., featured the November 18 dinner-meeting of the Ontario Rubber Section, C.I.C. Approximately 100 members and guests were present at the meeting, which took place at McMaster University, Hamilton, Ont., Canada.

Mr. Chase's talk was similar to that given before the Rubber & Plastics Division, A.S.M.E., in Erie, Pa., on September 28 and reported on page 202 of our November issue.

In addition the speaker noted that a recent design feature is the enclosing of gears in a separate unit where they are not affected by heat and stresses created by the working elements of machines. Another trend is toward the use of extruders, strainers, and pelletizers to receive stock directly from the Banbury without a sheeting mill, resulting in savings in labor, greater cleanliness, and more uniform products. Screw-type machines have also been developed in the larger sizes for the continuous processing of certain types of plastics.

New Cyanamid Chemical

THE availability in trial-lot quantities of a new chemical, diallylcyanamide, has been announced by American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y. The new material is a liquid having a boiling point of 222° C. and a freezing point below —70° C. Less than 1% soluble in water at 28° C., diallylcyanamide is miscible with most organic solvents and acts as a solvent for most natural and synthetic resins. The chemical reactions of this material are based mainly on the reactivity of the nitrile group with compounds containing active hydrogen.

In addition to diallylcyanamide the dimethyl, diethyl, and diisopropyl cyanamides are also available in experimental quantities. All of these compounds are believed to be of interest to the rubber, plastics, petroleum, textile, paint, and paper industries. A technical bulletin giving the chemical and physical properties of these compounds may be had from the company's new product development department.

New Adhesive for Butyl

THE problem of bonding Butyl rubber to metal during molding operations, one of the most difficult adhesion tasks known at present, is said to be solved with a new preparation, designated as No. 12623 cement, developed by Dayton Chemical Products Laboratories, Inc., West Alexandria, O. Since its development Butyl has been most difficult to adhere or splice to other materials. The new adhesive is recommended for such applications as vibration reducing mountings, bumpers, and other molded articles requiring the permanent adhesion of Butyl to a metal base. The company has also developed related formulations which bond Butyl to other synthetic rubbers. The new cement has already aroused considerable interest in the rubber industry and is expected to find increasing use in a wide range of applications.

Rubber Impregnated Leather

NATURAL rubber greatly improves the durability of leather in a new treating process developed by Rene Oehler, Timothy J. Kilduff, and Sverre Dahl, of the leather laboratory of the National Bureau of Standards, Washington 25, D. C. The impregnation process increases the abrasion and water resistance of leather so that sub-standard leather may be used commercially. Preliminary results from service tests of rubber treated soles indicate a definite improvement in wearing qualities over untreated soles.

Impregnation is accomplished by simple immersion of the leather into a solution of natural rubber whose viscosity has been reduced by preliminary cold milling of the rubber stock. This milling results in good penetration and maximum rubber deposit in the leather. Solutions have been made from gutta percha, *Hevea*, and Castilloa rubber, with *Hevea* smoked sheet giving the best results. If the grain layer is split away and the body of the leather allowed to remain in the solution overnight, penetration and distribution of the rubber are greatly increased. The deposited rubber may then be vulcanized at 80° C. with the aid of an accelerator of the dithiocarbamate type without harm to the leather. Comparative tests show the impregnated leather to have 50% the water absorption and transmission of untreated leather; while abrasion resistance is improved from 50-100%, depending on the type of rubber treatment.

Washington Group Hears Glenn

AT A meeting of the Washington Rubber Group in the Cosmos Club auditorium in Washington, D. C., on November 22, Earl W. Glenn, director, Rubber Division, United States Department of Commerce, spoke on "World War II Rubber Observations."

Roy J. Devereaux, The B. F. Goodrich Co., chairman of the Group, presided and introduced Mr. Glenn. Mr. Devereaux also explained that the previously announced program on military requirements for rubber which had been planned as a panel discussion with participation by experts from the Army, Navy, and Air Force, but which the Group had been forced to cancel at the last minute, was now scheduled for January.

Mr. Glenn, who for eight months, beginning in December, 1944, traveled through England, France, Holland, Belgium, and Germany as an expert consultant for Army Ordnance, discussed the performance of rubber in the Army in the latter part of the war and illustrated his remarks with pictures taken on his trip. He emphasized the premature failure of hundreds and thousands of tires and tank bogie wheels and tracks made with synthetic rubber and indicated that we had not been quite so successful as was thought at that time in the use of synthetic rubber for the Armed Services. Even with the continued use and development of synthetic rubber, the size of our stockpile of natural rubber is an extremely important part of our long-term rubber policy, the speaker pointed out.

The talk was concluded with the showing of many slides of interesting scenes from Germany and France, some for their connection with the rubber industry and some for their pictorial and historical value.

Connecticut Group Elects

THE fall meeting of the Connecticut Rubber Group on November 4 took the form of a tour through the plant of Armstrong Rubber Co. at West Haven, Conn. Approximately 110 members and guests were escorted in groups of six through the entire plant, beginning with the finished tire and going back through each operation to the raw materials. Of special interest were the modern production equipment and the good housekeeping practices in evidence in the plant. Following the tour, refreshments were served and souvenir gifts distributed through the courtesy of the company.

Results of the Group's recent mail balloting for new officers and directors were announced, as follows: chairman, Donald Spengler, Sponge Rubber Products Co.; vice chairman, Carl A. Larson, Whitney Blake Co.; secretary, George R. Sprague, also of Sponge Rubber; treasurer, Francis Rooney, General Electric Co.; and directors, Gus Maassen, R. T. Vanderbilt Co., Inc., D. Welch, Naugatuck Chemical Division of United States Rubber Co., Emil Schwartz, Southern Clays, Inc., and H. V. Allison, Allison Co.

Southern Ohio Group Meets

THE Southern Ohio Rubber Group held its fall dinner-meeting on October 27 at the Engineer's Club, Dayton, with 80 members and guests attending. Feature of the meeting was a talk on military photography by Col. G. W. Goddard, Chief of the Photographic Laboratory, U. S. Air Force. Assisted by Carl Balcomb, project engineer at the Laboratory, Colonel Goddard discussed high-speed photography of large land areas; day and night pictures; high altitude photography; three-dimensional photography of New York, Chicago, Detroit, and New Orleans; and moving three-dimensional pictures of bombed German cities. The use of illustrative films and slides added to the interest of the talk, which was effectively presented and very well received.

In the business session preceding the talk, S. L. Brams, Dayton Chemical Products, Inc., reported on the A. C. S. Rubber Division meetings at Boston and Atlantic City this year in his capacity as Group delegate to the Division. Mr. Brams also announced the election of J. E. Feldman, Inland Mfg. Division, General Motors Corp., as Group delegate for 1950. It was also decided that a newssheet for members be initiated, to be published by H. L. Rucker and R. S. Radow, both of Dayton Rubber Co.

New Name for Staple Fiber

DYNEL, a new generic name to denote its acrylonitrile-vinyl chloride staple fiber, as distinguished from the older Vinyon yarns, has been chosen by Carbide & Carbon Chemicals Corp., 30 E. 42nd St., New York 17, N. Y. Dynel is expected to become a fiber of major importance. Among its many advantages are high resilience, "loft," warmth, strength, fire resistance, mothproofness, and fungus inertness. In addition the fiber possesses dimensional stability; dries rapidly; can be dyed

(*Continued on page 366*)

RUBBER WORLD
NEWS of the MONTH

Tire and Tube Prices Increased 7%; Many Difficult Problems Face Rubber Industry in 1950

Tire and tube prices were increased 7% between October 25 and December 1, in two stages. Goodyear Tire & Rubber Co. initiated the first increase of 3½% on October 25, and Seiberling Rubber Co. the second 3½% increase on November 21. A further price increase of 3½% is still called for by some of the smaller tire companies. P. W. Litchfield stated that rubber as a commodity is involved in several "imponderables" which it might be inferred will make management of the rubber industry in 1950 more than usually difficult. E. G. Holt predicts a further small decline in rubber industry activity in 1950, but considers an industry consumption of 1,600,000 tons of rubber possible in the United States 50 years from now. New revised figures for rubber manufacturers' sales from 1946 through September, 1949, by the month have been obtained from the United States Department of Commerce.

Bargaining on pension and insurance plans between several large and small rubber companies has been recessed to provide time for the accumulation of much needed actuarial data. The company-wide pension and insurance agreement between the URWA and The B. F. Goodrich Co. of September 30 has been approved by the executive board of the union.

First Tire and Tube Price Increase

E. J. Thomas, president of the Goodyear company, speaking at a convention of the American Trucking Association in Boston, Mass., on October 25, announced that his company was raising passenger and truck tire and tube prices 3½%, effective, November 1. Mr. Thomas said that the price increases were made necessary by the substantial advances in manufacturing costs, while tire and tube prices have remained at or near 1941 levels.

Within the next few days similar price increases were announced by Firestone Tire & Rubber Co., United States Rubber Co., Goodrich, Dayton Rubber Co., Mohawk Rubber Co., and Seiberling. Most other tire manufacturing firms indicated that they would put the increase into effect within a few days or weeks.

The tire industry, in general, took the position that the price increase was necessary but inadequate and that a further increase might be required about January 1.

In the judgment of the Goodyear management, the 3½% increase was as far as the company could go at this time, according to Mr. Litchfield, chairman of the board. Despite the increase, Mr. Litchfield feels that tire prices are still too low in relation to costs, without even considering the extra expense all rubber goods manufacturers face in the months ahead with new or expanded pension programs.

"Our increases had nothing to do with pensions," he declared. "We set the price on what we thought the market would allow at this time and still permit stability in prices."

L. R. Jackson, Firestone president, in commenting on the tire and tube price increase at the National Association of Independent Tire Dealers' convention in Cincinnati, O., November 2, said that the advance was "not sufficient to compensate for the higher level of present costs."

The amount of another price advance, should it come, is uncertain, he added. To provide a fair profit from tires on the basis of present costs, however, another increase of more than 3½% would be necessary, Mr. Jackson said.

J. P. Seiberling, president of the Seiberling company, in an interview at the NAITD convention called the 3½% advance as merely moving "from starvation to subsistence" and asserted that "the industry is entitled to a fair profit on its business."

Second Tire and Tube Price Increase

Seiberling on November 21, then announced another increase of 3½% on prices of tires and tubes sold for replacement purposes.

Mr. Seiberling stated that the increases, which were effective November 25, were "badly needed" by the tire industry, and that his company was raising prices because "tire and tube prices are still too low in relation to cost of manufacture"—in spite of the increase effective November 1. "Seiberling Rubber Co. has taken the initiative in correcting this situation," he said and added: "We hope others in the industry will recognize the justification for this increase."

Prices of automobile, truck, and earthmover equipment tires and tubes manufactured by the company were affected by the increase. No increase was made in the prices of farm tractor and implement tires and tubes.

On November 23, U. S. Rubber, Cooper Tire & Rubber Co., and Mohawk also announced an increase of 3½% on automobile and truck tires and tubes, effective November 30.

The U. S. Rubber statement said that tire prices were still uneconomically low and the new increase will merely restore prices to approximately the same level that existed at the beginning of the year. Both of the smaller companies indicated that further increases are needed badly, and another 3½% price increase might be made in the spring.

On November 25, Dayton Rubber, through I. Eisbrouch, vice president in charge of sales, announced that a price increase of 3½% on all passenger and truck tires and tubes made by that company would become effective on December 1. This company also took the position that even with the second price increase in a little over one month, the price was still insufficient to provide an adequate return on the basis of present costs.

It is understood that Goodyear made another 3½% tire and tube price increase effective December 1, as did Norwalk Tire & Rubber Co. Other rubber companies both large and small are expected to increase their tire and tube prices accordingly.

Tire Dealers Suit

The NAITD suit against six tire manufacturing companies for alleged price discriminations filed about a year ago may be settled out of court, it has been reported. It is understood that the lawyers on both sides have been holding conferences on the subject, and the NAITD may withdraw the suit in return for a cash settlement.

The six defendants, Goodyear, Firestone, B. F. Goodrich Co., General Tire & Rubber Co., U. S. Rubber, and Lee Rubber & Tire Corp., would like to settle the NAITD suit as soon as possible in view of the further legal complications involved if the Federal Trade Commission puts into effect its proposed rule limiting the size of discounts tire manufacturers can give their biggest customers.

At the same time the NAITD is trying to get the FTC to rule that the fifth tire on new automobiles is not original equipment, but a replacement tire. Such a rule would reduce tire manufacturers original equipment business by about one-fifth.

Recapping on Increase

There is increasing evidence that tire recapping, which was necessary during the war years to a greater extent than ever before, is again being used for passenger and truck tires at about double the prewar level. It is estimated that about 130 million pounds of camelback will be used in 1949, about 20% more than used last year. Two reasons are given for the increase in the demand for tire recaps: one is the cost, which is about half to one-third of the cost of a replacement tire, and the other is the higher profit margin to the tire dealer as compared with the replacement sale. The recapped tire is usually good for from 80 to 90% of the mileage of the new tire if the carcass was in good condition at the time of recapping.

Nobody knows exactly the relative number of truck and passenger-car tires being recapped, but the trend seems to be toward the use of a greater tonnage of material in recapping truck tires where the saving per unit, as compared with a new tire, is greater.

Litchfield's No. 11 "Notes on America's Rubber Industry"

In another one of his "Notes on America's Rubber Industry", this number 11 of a "New Series," P. W. Litchfield, chairman of the Goodyear board, discusses "Rubber — Problem Child among Our Basic Commodities."

Mr. Litchfield states that the general management of rubber is complicated by an array of imponderables which put it in a class by itself. Rubber as a commodity is involved in: (1) our own national security against outside aggression; (2) the economic fortunes of nations friendly to us; (3) the fact that neither *natural* nor *synthetic* markets are "free" in the customary sense, but are controlled in various ways by the governments of producing and consuming nations; (4) the need to protect the American *rubber* consumer against unjust exploitation; (5) the preservation of facilities for further research in *synthetic rubber*; (6) the stability of 250,000 jobs held by Americans within the *rubber*

industry; and the investment of about $2,500,000,000 in the American *rubber* industry.

It is again emphasized that in 1950 it will be necessary for synthetic rubber to make up the difference between the available world supply of natural rubber and the consumption of all rubber, plus stockpiling, and that at some predetermined time thereafter, it is estimated that the total available natural rubber can reach a figure of 2,000,000 long tons annually or *more than enough to supply the world's total needs.*

Mr. Litchfield makes the point that natural rubber has a 25% competitive advantage over synthetic rubber on a technical basis. Currently the price of first-grade natural rubber to the American buyer in New York is 16½¢ a pound, and this represents a price advantage for natural rubber. Regardless of how low the price of *natural rubber* may drop, however, we are compelled by considerations of national security to keep our *synthetic rubber* producing facilities in good working order. If there is not a voluntary market here at home for a certain part of the output of these synthetic plants, then the government must protect our security by making mandatory the use of sufficient synthetic rubber to serve these purposes, it was added.

Mr. Litchfield concludes his discussion with comments on the prevailing low level of tire prices and says that these prices are below the level of economic justification and are forced to that low level by factors of excessive competition within the industry.

Holt on Rubber Outlook for 1950

In a talk before the Foreign Trade Group of the Akron Chamber of Commerce, on November 17, Everett G. Holt, assistant chief, Rubber Division, Office of Domestic Commerce, of the Department of Commerce discussed "Rubber Materials and the Outlook for 1950."

He briefly reviewed the international rubber position, emphasizing that world production of natural rubber is still less than consumption and that the deficit must be made up by chemical or synthetic rubbers and that capacity for production of enough natural rubber to supply amply total world needs is not in sight yet since political conditions in Indonesia still do not permit attainment there of capacity output.

With regard to the general trend for 1950, Mr. Holt predicted a further decline, but not very much, in U. S. consumption; a further decline in consumption also in the United Kingdom and Canada, which showed reduced 1949 demand; probably some decline, unless Russian takings increase, in remaining countries. Overall 1950 consumption of new rubber might be 1,800,000 tons plus, compared with 1,875,000 plus in 1949. World production of natural rubber is expected to be as large as in 1949 except in Indonesia and Indo-China, but Mr. Holt was not optimistic for increased 1950 output over 1949, for which total will be about 1,480,000 tons.

The broad question of whether the rubber industry is so much influenced by "price per pound," as is argued, was also discussed. It was pointed out that in the third quarter of 1949, with a 16½¢ a pound price for 1X R.S.S. compared with an average of 22¢ a pound in 1948, the industry was maintaining the use of synthetic rubbers remarkably well.

Reasons for the maintenance of synthetic rubber use through the third quarter of 1949 are not conclusive of what the effect of longer continuation of the 16½¢ a pound price level for natural rubber would be, or of what would be the effect of lower prices if they should occur, Mr. Holt was careful to point out. Lower prices would not be likely to stimulate the production of natural rubber, and a deficit in natural rubber supply would make for continued economic use of synthetic rubber, he added.

The recession in overall consumption of rubber in the United States in 1948 and 1949, compared with 1947, has brought in its train more severe price competition. Mr. Holt referred to income tax reports of rubber corporations which show average earnings, after payment of income and excess profits taxes and after deducting deficits experienced by companies which operated at a loss, amounting to 3.8% of gross income for the industry during the 1935-1946 12-year period. This compares with an average of only 0.84% earnings in the preceding 17 years ended 1934. Taxes paid to the Federal Government in the last 12 years, including $978,964,000 income and excess profits taxes and $649,151,000 excise taxes on tires and tubes, were nearly twice as great as industry net earnings of $848,350,000 remaining for the rubber industry after allowing for deficits of non-profit companies. A high rate of economic activity, high employment, high wages and salaries, high industry earnings, and high taxes are all necessary for our national financial well-being, and any return to the conditions of competition of the 1920's should be guarded against, Mr. Holt warned.

In conclusion he estimated that the United States would be using at least 50% chemical or synthetic rubbers 50 years hence, or say 800,000 tons a year. We should bear in mind that cost per unit of service, and not mere cost per pound of material is the important element, and that the inroads made by rayon and nylon in the field supplied by cotton tire cord exemplify the fact that the tire industry itself is prone to consider elements in addition to initial cost per pound, Mr. Holt declared. If the estimates should be reasonably indicative, and if the rest of the world continues to rely chiefly on natural rubber, there would then be a market for more than 3,000,000 tons annually of natural. This would require an increase of more than 100% in the present output of natural rubber; so the outlook for efficient producers, granting world peace, would still be hopeful.

Business Trends—Commerce Department Figures, Etc.

In our November issue on page 206, under the above heading, we reported that the Commerce Department's "Industry Survey" for September showed manufacturers sales of rubber products totaling $315,000,000 for August, as compared with $271,000,000 for July, and stated that this figure represented a decided upturn in rubber industry sales for the year. The October issue of "Industry Survey" gives the revised sales figures for August as $295,000,000, which, compared with the $271,000,000 for July, is still a decided increase. We neglected to mention, however, that all these figures were on a "seasonally adjusted" basis and therefore were not direct sales figures. Preliminary figures for September, as given in the October issue of this Commerce Department publication, were put at $267,000,000.

We wish also to correct an error in the report on page 206 of the November issue of India RUBBER WORLD on this subject where we gave figures for January and February, 1949, for manufacturers' sales of rubber products as about $330,000,000 for both months. Figures for January and February, 1949, were actually $260,000,000 and $251,000,000, respectively.

In order to obtain a better understanding of these manufacturers' sales and also inventory figures, as supplied by the Office of Business Economics of the Department of Commerce, and in view of the changes in the method of reporting such figures that have occurred during the past year or more, the editor of India RUBBER WORLD visited the Office of Business Economics and discussed these matters with some of the personnel of that office. For those interested the details of the preparation of these business statistics and the recent changes that have occurred in the method of their reporting are explained beginning on page 12 of the October, 1949, issue of the Commerce Department's publication, "Survey of Current Business." The most important point seems to be that the figures have all been revised from 1946 through September, 1949, and are now reported on the same "seasonally adjusted" basis. The direct sales figures are in many instances of equal or greater value than the "seasonally adjusted" figures. These latter figures are available from the Office of Business Economists, on request, and are presented herewith from 1946 through September, 1949, together with the "seasonally adjusted" figures" to replace any figures previously reported.

It would appear from the figures for 1949 that, although August provided the largest total sales volume for the first nine months, June was not far behind on a

LATEST REVISED COMMERCE DEPARTMENT FIGURES, RUBBER INDUSTRY MANUFACTURERS' SALES (MILLIONS OF DOLLARS)

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1946												
Unadjusted	229	207	241	261	266	261	249	271	266	319	280	312
"Seasonally adjusted"	236	222	236	257	258	247	263	277	275	294	288	305
1947												
Unadjusted	280	278	308	296	285	286	274	285	305	335	302	282
"Seasonally adjusted"	289	299	302	291	276	271	290	291	315	300	311	276
1948												
Unadjusted	263	247	276	290	282	316	313	324	307	319	282	286
"Seasonally adjusted"	271	265	270	285	273	299	331	331	317	294	291	280
1949												
Unadjusted	251	234	265	261	257	281	257	289	269			
"Seasonally adjusted"	260	251	260	257	248	266	271	295	267			

direct sales basis, but that this fact was obscured by the "seasonal adjustment." It would also appear that on either basis, sales for the first nine months of 1949 parallel most closely sales for the first nine months of 1946 and are running on an average between 25 and 30 million dollars a month behind 1948.

The regular monthly report of The Rubber Manufacturers Association, Inc., for tire and tube production and shipments stated that manufacturers' shipments of passenger-car tires declined seasonally in September to 5,821,679 units from the August total of 6,779,736. Production of passenger tires dropped about 10% to 4,950,553 units, as compared with 5,538,251 in the previous month. Inventories of passenger tires were also down about 10% to 7,123,460 units, as compared with 7,925,593 at the end of August.

Shipments of truck and bus tires declined 9% in September to 897,283 units, as against 988,205 the month before. Production was down to 644,031 from 690,148 in August, a drop of about 7%. Manufacturers' inventories of truck and bus tires totaled 1,812,905, as against 2,044,067 at the end of the prior month.

Automotive tube shipments were off 11½% of 5,841,983 units from 6,603,353 during August. Production of tubes also declined about 5% to 4,902,319 from 5,169,382 in the previous month.

The regular monthly RMA report on consumption of new rubber in the United States estimated that 84,070 long tons were used in October, an increase of 11.4% over September consumption of 75,503 tons.

Consumption of natural rubber rose sharply to 50,693 tons from 43,372 tons in the previous month, an increase of 16.9%. Synthetic rubber consumption also rose during the month to 33,377 tons from 32,131 tons in September, or a rise of 3.9%. Of the synthetic rubber consumed, 25,788 tons was GR-S, 2,744 tons neoprene, 4,150 tons Butyl, and 695 tons were nitrile type rubbers.

For the first ten months of 1949 total consumption of new rubbers amounted to 819,387 long tons, compared with 902,988 tons in the 1948 period, a decrease of 9.3%.

Labor Relations News

Bargaining between the United Rubber Workers of America, CIO, and Goodyear and U. S. Rubber on the subject of a wage increase and/or pension and insurance plans continued during October, but were recessed early in November to permit the companies and the union to study the pension and insurance problems more thoroughly.

Information such as records of workers on the present payrolls, their ages, length of service, and particularly their past earnings are needed since such data figure importantly in the cost of pensions and social insurance and will take time to assemble. The companies are proceeding cautiously in settling pension contracts, realizing that pensions are long-term commitments and might prove so costly at some time in the future that a company's financial condition could be endangered.

The union held a meeting of its top officials in Cleveland, O., early in November to consider securing the help of experts in the field of pensions and insurance to help its negotiators in dealing with company representatives. The need of this type-help has become most pressing with the smaller local unions, many of which are now opening negotiations with their companies. In addition the union is assembling its arguments for the non-contributory type of pension plans which it favors. The union prefers to have the pension money set aside and a company-union committee administer the benefits. URWA officials take the position that insurance companies require too big a fee for administering the plans. Some company executives have told the union, however, that the insurance company administered pension plans will afford greater protection for the workers because the income from the fund is guaranteed, no matter what the financial condition of the company in question may be.

Lovell Mfg. Co., Erie, Pa., and the URWA announced at the end of October that a settlement on the pension question had been reached. The company has agreed to set aside 10¢ an hour per worker for pensions and insurance, but the details of this plan will also require further negotiation.

Goodyear and the union have agreed on a 10¢-an-hour-per-worker package for pensions and insurance as indicated last month, and negotiations were scheduled to be resumed on November 28 to work out the details.

The Automobile Manufacturers Association distributed a booklet during November entitled "Some Anomalies in the Steel Board's Report and Some Fallacies of 'Fact' Finding." This booklet was written by Theodore R. Iserman, an outstanding authority in the field of labor law, and the AMA explains that it was not prepared for the Association, but for Mr. Iserman's clientele and friends. It is being distributed as a contribution to the understanding of this important subject by the AMA.

The following extract from Mr. Iserman's booklet is reproduced herewith as an indication of his thinking:

"The workers whom these insurance and pension plans are supposed to benefit will find themselves in an odd posture. The plans will have forced up their cost of living, but because they will be unable to spend their insurance and pensions, their real spendable earnings will be less than the earnings are now. The higher living costs will lessen the value of their present wages; and many of them will never receive benefits under the insurance and pension programs.

"The millions of Americans, the vast majority, whose incomes are determined by economic laws, not Government recommendations and union pressures, will, as usual, be yet more unfortunate.

"And when doing what the Steel Board recommends achieves its full effect, we may yet expect to see a new, fifth round of demands to 'equalize' union labor's income with the new increase in the cost of living it will have brought upon itself and everyone else."

The company-wide agreement between Goodrich and the URWA of September 30 was finally approved by the union's executive board on November 15. It is understood that the Goodrich settlement produced some disagreement on the board and that several members refused to vote approval, arguing that the agreement does not meet the standards the union had set as its goal. The principal objection centered around the contention that the insurance company that administers the plan uses up too much of the money invested both by the company and the workers.

A strike at the Ashland Rubber Products Co., Ashland, O., last month, resulted in the filing of charges by the company with the National Labor Relations Board charging the local URWA union with "coercing non-striking workers who want to enter the plant". The local union countered with charges of unfair labor practices by the company.

The strike began on November 3 when the company refused to recognize the local URWA and to negotiate with it on a wage increase and pension and insurance provisions for the union members.

The company on November 15 filed injunction proceedings and a $250,000 damage suit in Ashland County Common Pleas Court against the local union for damages resulting from the strike.

Workers at the Armstrong Cork Co. voted in an NLRB election to retain the URWA as bargaining agent, it was announced on November 16. It was reported that both the AFL and the company had challenged the URWA's right to represent the workers in the Armstrong plants. The URWA received 1,998 votes to 1,003 for the AFL in the election at the company's floor covering plant. A total of 3,181 voted, with 180 balloting against either union. In the election of workers in the closure plant 396 voted for the URWA, 166 for the AFL, and 17 for no union.

Changes at Bearfoot Sole

The Bearfoot Sole Co., Inc., Wadsworth, O., through its directors has approved for 1950 the expenditure of $124,000 for expansion in production facilities; the firm this year already has completed on schedule its second modernization and expansion program costing $156,000.

L. E. Hardwick, with Bearfoot 10 years, has been elected its vice president in charge of sales. He joined the company's legal department after practicing law in Winchester, Ky. During World War II, Mr. Hardwick was counsel for the Bearfoot firm, handling all war contracts and special assignments and all legal matters in connection with the company's $550,000 expansion program. In 1945 he assumed some of the duties of Edwin Calvin as domestic sales manager following the latter's illness.

Announcing Mr. Hardwick's promotion, I. B. Calvin, Bearfoot's treasurer, said that in the year just closed the company's sales increased 12½% over those of the previous year.

Homer I. Beaver has been advanced from superintendent to vice president in charge of all production at Bearfoot. Mr. Beaver began as a foreman with the company 21 years ago; he became superintendent in 1944.

Armstrong Cork Co., Lancaster, Pa., is marketing a new flooring product, a resilient plastic asphalt tile called Arlon. The new tile combines a completely different monochromatic concept of coloring with high resistance to oils, greases, fats, alkalis, and wear, it is claimed. Developed to meet the demand for a distinctive flooring material that combines the richness of plain colors with the practical features of marbleized patterns, the new tile is made in eleven blended pastel colors. The tile's exceptionally high resistance to alkalies makes it practical for installation on grade or below grade, as well as on suspended wood or concrete subfloors. The new product is being made in nine-inch square tiles in both ⅛- and 3/16-inch thicknesses.

EAST

Introduces New Tire

The "mid-century" U. S. Royal Master, a new auto tire said to give greater traction and safety than any other tire to date, was announced last month by United States Rubber Co., Rockefeller Center, New York 20, N. Y. Different in appearance and styling, the new tire features a scuff-proof white sidewall and a special tread that virtually eliminates the need of chains in most kinds of winter driving. According to A. W. Bull, director of tire development, the new tire's exceptional traction is due to an exclusive tread pattern consisting of countless flexible tread blocks which grip the road for greater straight-line stopping power and added safety. The tire's performance on snow and ice greatly reduces the need of chains, Dr. Bull said, and its pulling power is greater than that of ordinary mud and snow tires on ice or snow covered highways. The problem of how to keep white sidewalls looking new has been solved by the new tire, Dr. Bull said, owing to a "curb-guard" rib of rubber around the outer rim of the white wall, so designed that it acts as a protecting buffer against the curb. The "curb-guard" not only holds the white wall away from the curb, but actually pushes the whitewall section back into the tire to prevent curbside scuffing. Incorporating the company's Air Ride low-pressure construction, the new tire will be sold as an extra-quality product replacing the present Royal Master.

Other Recent Developments

A plastic cable splice housing which is said drastically to reduce the time needed to splice power and signal cables and to give a durable watertight electrical seal has been developed by U. S. Rubber. The new housing eliminates lengthy outside wrapping operations for splicing, thereby cutting splicing time from a matter of hours to a matter of minutes. The new housing is recommended for both aerial and underground installations and can be used with both rubber or neoprene cables. Experiments are now under way to determine its serviceability on lead jacketed cables. The housing's main structural part is a pipe made from a tough, corrosion-proof blend of synthetic rubber and thermoplastic resins. This pipe fits over the cable joint, and two rubber seals are used in the pipe to make a moisture-tight seal. Threaded plastic caps on each end of the pipe grip the cable and insure a tough, finished joint. The housing is tough; resistant to sunlight, wide temperature ranges, acids, oils, and alkalies; and has extremely low water absorption and high electrical insulating properties. The housing will be marketed in two diameter sizes: 1.5-inch I.D. for cables of one-inch maximum thickness; and two inches I.D. for cables up to 1.5-inch maximum thickness. The pipe will be furnished in required lengths, based on the length of splice. A special design has also been developed which permits a "Y" splice connection.

The U. S. Super Powerlife battery, a new automobile storage battery said to have more power, longer life, and other advantages, was announced recently by U. S. Rubber. The new battery will provide quicker starting, more electrical power for accessories, and has three times the liquid capacity of ordinary batteries, according to the company. This additional liquid reserve permits the battery better to withstand engine heat and eliminates the need of frequent refills, since water is required only once a season or less in normal use. Fiberglas mats are used in the battery's construction to help preserve the power producing plates; while all-rubber separators are used for better insulation and to help provide extra power for quicker starting. The battery will be produced for all makes of automobiles and for trucks using passenger-car-size batteries.

U. S. Rubber's New Scuff-Proof "Mid-Century" U. S. Royal Master Tire (*above*) and Conventional Whitewall Tire (*below*) after Performance Tests

Rubber springs which take the jerks and bumps out of riding a tractor have been developed by U. S. Rubber. The springs operate on a torsional shear principle and consist of a thick layer of specially compounded rubber sandwiched between two metal plates to which it is fastened by a brass plating process. The springs are mounted in pairs on a new tractor seat being produced by Bostrom Mfg. Co. As the tractor rides over rough ground, the rubber twists and turns with each bump and jolt, cushioning the initial shock and leveling out the sharp rebound which normally occurs with the use of a heavy steel spring.

Sawyer Heads Automotive Sales

Fred A. Sawyer has been made manager of automotive sales for products of the footwear and general products division. His headquarters will be in the company's Detroit branch at 5850 Cass Ave. In his new position Mr. Sawyer will be responsible for all products of the division sold to automobile manufacturers and allied customers in the Detroit area, including foam cushioning, automobile mats, coated fabrics, fuel cells, sponge rubber products, and Royalite plastic parts. Mr. Sawyer joined U. S. Rubber in May, 1939, as a sales engineer, contacting automotive customers. Later responsibilities included extensive engineering and sales work with foam, fuel cells, and other automotive products. Early in 1946, Mr. Sawyer was made manager of development sales of the footwear division and in July, 1947, manager of the plant in Chicago, Ill., where fuel cells for planes, buses, and trucks Royalite plastic parts, etc., are made.

Graybill, Brown Advanced

The General Tire & Rubber Co., Akron, O., has made Richard Graybill manager of its Philadelphia branch, to succeed R. F. Blondin, resigned. In assuming managerial reins in Philadelphia, Mr. Graybill directs General Tire sales for Pennsylvania, Delaware, Maryland, District of Columbia, and the northern parts of Virginia and West Virginia.

Roy F. Brown has been appointed to succeed Mr. Graybill as manager of the company's New York branch, covering New York, New Jersey and Connecticut.

A graduate of Cornell University, Mr. Graybill has 14 years' experience in the tire industry. He started with General Tire as territory sales representative at Williamsport, Pa., in 1945, was appointed assistant to H. A. Bellows, eastern division manager, a year later, and managed the New York branch for the last year.

Mr. Brown has 19 years' experience in the tire industry. He signed with General Tire in 1939 as territory representative in New York, N. Y., but shortly after Pearl Harbor joined the War Department, working with the ordnance division in rubber conservation. He returned to General Tire in his former capacity in October, 1944, and was placed in charge of all car dealer sales in New York, N. Y., in 1947.

Bayshore Industries, Inc., Elkton, Md., was the subject of a story in the November issue of *Esso Oilways*, published by Esso Standard Oil Co. Entitled "Making Faces at Elkton," the story describes and illustrates the production processes and products of Bayshore, manufacturer of latex masks, false faces, balloons and novelties, and fabricated vinyl party costumes for children. An interesting feature of the article was a history of the use of masks from prehistoric days to the present time.

The Catalin Corp. of America, New York, N. Y., has placed a contract with the chemical plants division, Blaw-Knox Co., Pittsburgh, Pa., for the design and construction of a liquid resin plant at Calumet City, Ill. The plant will produce liquid phenolic, urea, and melamine resins for use in waterproof adhesives and binders. Ground was broken for the new plant on November 10, and initial operation is scheduled for March, 1950.

Ideal Novelty & Toy Co., according to Elliott Harrow, general manager of the Genoco division, as the result of extensive tests of old and new materials including rubber, is now using Koroseal exclusively in all its inflated toys. Items made of Koroseal—the B. F. Goodrich flexible material—include a laughing doll, animals, Santa Clauses, bath and beach novelties, inflatable cut-out books, and comic character bop bags. Ideal is one of the country's largest makers of dolls, plastics and mechanical toys. Since February, 1947, it has been operating in the former factory of Ranger Aircraft Co. at Hollis, L. I., N. Y.

Rubberset Co., which has established executive offices and principal manufacturing facilities at the recently acquired plant at Haynes Ave. and Lincoln Highway, Newark 5, N. J., recently sold its former main factory at 56 Ferry St., Newark.

Directors' and General Conference Room of Harwick Standard

Office of Harwick Standard Chemical Co.'s President, J. R. Moore

Rail Shipping and Siding Facilities Border the Harwick Standard Warehouse

Plans Expansion Program

Charleston Rubber Co., Stark Industrial Park, Charleston 58, S. C., which began operations about 20 months ago and now manufactures linemen's rubber gloves, "Bulldog" safety clamps and danger flags together with allied items such as glove bags, inner liner gloves, leather protector gloves, and improved solder ladles, is installing additional equipment in its present plant and drawing plans for a new building to house a new industrial products division.

This division will produce a new type of synthetic rubber glove based on Buna N type synthetics combined with other resins and plastics, for which the company has great expectations. Charleston Rubber will also have available a complete line of neoprene and natural rubber industrial gloves plus a line of industrial aprons made from both plastics and synthetic rubber coated fabrics.

The firm was among the exhibitors at the recent National Safety Council convention in Chicago, at which time it appointed distributers in all 48 states.

New Engineering Department

The organization of a new advanced engineering department to be headed by Robert W. Barber was announced by C. Russell Mahaney, vice president and general manager of the Panelyte division, St. Regis Paper Co., 230° Park Ave., New York 17, N. Y. The new department will be responsible for forward planning and development of new laminated plastic materials and products made by the division. Mr. Barber, formerly Panelyte's chief engineer, was succeeded in this position by George E. Vybiral, former assistant chief engineer.

Harwick Standard Opens New Plant and Offices

Harwick Standard Chemical Co., celebrated the official opening of its new plant and general offices at 60 S. Seiberling St., Akron, O., with an open-house party on October 22. More than a thousand guests representing manufacturing firms in Akron and other parts of the country attended the celebration, viewed the new facilities, saw displays of products utilizing the company's materials, and received souvenirs of the event.

Since the company was founded in 1932 by Curtis J. Harwick, it has made extensive strides in the manufacture and distribution of chemicals and compounding ingredients for the rubber and plastics industries. Since the death of Mr. Harwick in July, 1948, the company under the leadership of J. R. Moore, president, and Mrs. Virginia L. Harwick, board chairman, carried through the original plans of Mr. Harwick for the new building.

The new plant provides 50,000 square feet of space on two floors. Manufacturing is centered in one section, with extensive warehousing space adjoining, and the general offices occupy another section. A unique decorating plan followed throughout the offices creates a warm, friendly atmosphere to employes and visitors, and a completely equipped kitchenette is provided for employes.

Harry L. Fisher, U. S. Industrial Chemicals, Inc., was elected to honorary membership in the American Institute of Chemists by the national Council of that organization. The membership was conferred upon him at a meeting of the Baltimore Chapter in Baltimore, Md., on October 26.

Dayton Sales Set-up Realined

The Dayton Rubber Co., Dayton, O., through President A. L. Freedlander announced on November 17 the following organization promotions, additions, and realinement of duties to carry out the 1950 sales and merchandising program of the company.

Carl W. Priesing has been appointed vice president and general sales manager, to direct the coordination of all selling and merchandising activities. Mr. Priesing formerly was general sales manager of the Ansco Division of General Aniline & Film Corp., and previously had directed several national selling organizations in industrial and consumer markets. Mr. Priesing is a graduate of Tufts College and holds a master degree from Harvard Business School.

Irve Eisbrouch, vice president in charge of tire sales, will not only be responsible for tire sales, but also associate lines such as camelback, repair materials, and other new products which lend themselves to marketing through the tire sales division.

Leonard C. Strobeck, vice president in charge of mechanical sales, will direct all field selling activities of the company's present mechanical lines including textile products and other mechanical goods products as they reach the merchandising stage.

Herbert S. Waters was appointed vice president and director of products. He will be in charge of merchandising and the preparation of products, other than tires, for the market after they have passed the laboratory and development department stage.

Mr. Freedlander said, "The company's expanding product diversification program and its intensified sales and merchandising activities require expanding the administration and coordination of all division functions.

"Our two newest lines, foam rubber and vacuum hose, are reaching the markets after more than ten years in the development and proofing stages. Other new products are scheduled for launching in our established markets."

Marvin W. Smith, president of Baldwin Locomotive Works, Philadelphia, Pa., has been elected a director of Westinghouse Electric Corp., Pittsburgh, Pa.

Denig, D'Alelio Advanced

Two important administrative changes, placing new managers over the production and research departments of Koppers Co., Inc., Pittsburgh, Pa., were announced November 1. Fred Denig, vice president, has been made manager of the production department; while G. Frank D'Alelio has been named vice president and manager of the research department, the position formerly held by Mr. Denig. These changes followed the resignation—because of ill health—of Hugh C. Minton, vice president who headed the production department.

A. R. Powell, assistant manager of the research department, has been made associate manager of that department.

Mr. Denig, who joined Koppers in 1921 and has been a vice president and manager of its research department since 1934, was chosen for the production post because of his wide knowledge of the operations of Koppers' six divisions and 58 plants.

A graduate of Rensselaer Polytechnic Institute, his first job was with the Cities Service Co. in Toledo, Ohio. After joining Koppers, he worked at the Seaboard Gas and Coke plant, later becoming an operator for the company's engineering and construction division. From 1929 to 1931 he was superintendent of the Philadelphia Coke Co., returning to the engineering and construction division then to become general superintendent in charge of operations. In recent years he has taken an active part in the planning and placing in production of a number of new-type plants, including the giant styrene and butadiene plant at Kobuta, Pa., which Koppers built for the wartime synthetic rubber program, and the demonstration plant of the U. S. Bureau of Mines at Louisiana, Mo., to make gasoline and other synthetic liquid fuels from coal. In his new position he will have general supervision of company production and safety activities with responsibility for manufacturing methods, procedures, equipment, and management.

Dr. D'Alelio, who joined Koppers in August, 1947, as an assistant manager of the research department, is widely known in the United States as one of the nation's leading authorities on plastics. At the age of 40, he already holds 269 patents, most of which are in the field of high polymers or plastics, has written several technical books, and has virtually completed a new book on high polymers, which is expected to be published during 1950.

A native of Charlestown, Mass., he was graduated from Boston College in 1931 and four years later received a Doctor of Philosophy degree from Johns Hopkins University. He then returned to Boston College as an instructor in its graduate school. All 12 years of his schooling, following parochial school, were under scholarships or fellowships awarded because of his unusual ability.

He joined General Electric Co. at Pittsfield, Mass., in 1935, later becoming director of all that company's plastics laboratories. During World War II, he received an indivdual citation from the Bureau of Naval Ordnance in recognition of his war research and development work. He also was a consultant on the Manhattan (atomic bomb) project at Columbia University. Previous to coming with Koppers, Dr. D'Alelio was vice president in charge of research for the Pro-phy-lac-tic Brush Co. for two years.

Dr. Powell joined Koppers in 1923 after four years' research on coal, gas, and other fuels for the U. S. Bureau of Mines. For a number of years he was in charge of large-scale research operations at the company's Kearny, N. J., and Chicago plants, and became assistant manager of the research department in 1932.

General Minton, joined Koppers in May, 1947, after a distinguished career in the Ordnance Department of the U. S. Army. During World War II he rose to the rank of Brigadier General, and served from November, 1942, to September, 1945, as Director, Production Division, of the Army Service Forces. He was awarded the Distinguished Service Medal for his "able direction" of that Division. Since coming to Koppers, he has built up a strong production department which works in conjunction with all the plants and divisions of the company.

Warren S. Lockwood

Natural Rubber Bureau Under Lockwood Set Up

The Natural Rubber Bureau has been established by the rubber growers of Southeast Asia for the purpose of further developing the market for natural rubber in the United States. Warren S. Lockwood, who has had extensive experience in the rubber field with the United States Commerce and State departments and who was executive vice president of The Rubber Manufacturers Association, Inc., from 1944 to 1946, following which he has been a foreign trade consultant and publisher of Lockwood's *Rubber Report*, has been appointed director of the Bureau, with offices at 1631 K St., N.W., Washington, D. C.

It is the purpose of the Natural Rubber Bureau to promote the expansion of the market for natural rubber in the United States by publicizing the advantages of natural rubber as a raw material and for such new uses as latex foam cushioning and rubber roads. As a representative of the natural rubber growers, the Bureau will do its best to supply accurate information about natural rubber in its various applications at all times to those interested, using all available channels of communication.

As a result of his acceptance of these new responsibilities on behalf of the natural rubber producing industry, Mr. Lockwood has announced in the November issue of his *Rubber Report* that he is discontinuing publication with the December issue.

In his *Rubber Report* he states that this action was taken because he felt that he could not continue to write a completely unbiased report and at the same time represent the natural rubber producing industry in the manner in which he intends to beginning January, 1950.

In addition, Mr. Lockwood gives his reasons for being particularly pleased with his position as director of the Natural Rubber Bureau, including the fact that he believes that natural rubber, and the industry and the countries which produce it, should be represented in its greatest market by an organization which can supply facts to all those seeking such facts and his belief that natural rubber represents the largest genuine dollar earner of the Marshall Plan countries, and consequently the most realistic single way we can contribute to a bigger world trade.

In this connection it was said that latex foam cushioning and rubber roads, and other volume new uses for natural rubber, represent the greatest chance presented by any major United States import for a consumption rise large enough really to count in the economy of the countries concerned and in the import deficit of the United States.

New Baker Castor Oil Head

I. Milton Colbeth, at a recent stockholders' meeting, was elected president of Baker Castor Oil Co., Inc., 120 Broadway, New York, N. Y. He joined the company in 1920 and after setting up a control system devoted his time chiefly to original research in castor oil processing, its derivatives and applications, which work led to issuance of several patents. In 1929, Mr. Colbeth was appointed chief chemist in charge of organic research and process design; in 1931, chemical director with supervision over all research, plant expansion, sales service, and other technical activities of the company; and in 1948, vice president of the operating division in complete charge of all technical and manufacturing operations.

Acme Advances Howell

Albert Kahn, president of Acme-Hamilton Mfg. Co., announced November 25 that Leaston J. Howell had been elected a director and made vice president in charge of operations for the company's two Trenton plants, Hamilton Rubber Mfg. Co. and Acme Rubber Mfg. Corp. Hamilton, founded in 1870, and Acme, founded in 1902, manufacture mechanical rubber goods.

Mr. Howell has been connected with the Hamilton company for 32 years and recently has been vice president and factory manager in charge of production for that division. Originally he was a chemist.

Mr. Howell has been a member of the technical committee of The Rubber Manufacturers' Association, Inc., for 25 years and was formerly chairman of that group. He also served on a similar national committee of the War Production Board during World War II. For several years during the war Mr. Howell also was a member of the Technical Advisory Committee of the National Synthetic Rubber Co., Louisville, Ky.

Hamilton and Acme, which were merged in 1947, maintain sales and service branches in Chicago, Houston, Los Angeles, and at 233 Broadway, New York, N. Y.

Figure prepared with cooperation of United States Rubber Company

How to make this boy behave!

These special plasticizers and other Socony-Vacuum products give many advantages to rubber and vinyl resins.

HAT . . . *Neoprene*
S/V Sovaloid L keeps Neoprene flexible at low temperatures encountered at high altitudes.

HEAD . . . *Natural Rubber*
S/V Sun Check waxes prevent cracking in sunlight.

FEATURES . . . *Vinyl Gaskets*
S/V Sovaloid C gives excellent oil-resistant qualities.

SHIRT . . . *Rubber Sheeting*
S/V Sovaloid A Special light-stable processing aid.

SWEATER . . . *Sponge*
S/V Ceremuls keep cell walls from sticking.

BELT . . . *GRS Belting*
S/V Sovaloid H gives permanent elasticity.

PANTS . . . *GRI Innertubing*
S/V Sovaloids maintain desirable qualities in Butyl rubbers.

LEGS . . . *GRS and Natural Blend*
S/V Sovaloid W gives good processing at low cost.

BOOTS . . . *Neoprene*
S/V Sovaloid W improves abrasion resistance, increases elongation.

BASE . . . *Vinyl Tile*
S/V Sovaloid C, low-cost plasticizer for vinyl tile.

SOCONY-VACUUM OIL CO., INC., 26 Broadway, New York 4, N. Y. and Affiliates:
MAGNOLIA PETROLEUM CO., GENERAL PETROLEUM CORP.

SOCONY-VACUUM
Process Products

Process Products
SOCONY-VACUUM

Pike Forms Own Brokerage

Sidney James Pike, who is well known in the rubber field, has announced the formation of S. J. Pike & Co., Inc., to import natural rubber for distribution to the rubber industry, and natural gums and latex from Central and South America and the Far East for distribution to the chewing gum industry. Offices are located at 30 Church St., New York 7, N. Y.

Mr. Pike has been actively engaged in the importation of natural rubber for the past 31 years and recalls when all rubber from the Far East was forwarded to Pacific Coast ports, where it was shipped overland for distribution to the various rubber centers. Rubber, for instance, to be consumed in Jersey City was landed at San Diego, Calif., and shipped overland; the running time from San Diego to Jersey City was anywhere from three weeks to three months.

Later Mr. Pike joined Fred Stern & Co. as traffic manager, and thereafter his activities turned from traffic to sales work. About December, 1926, Mr. Pike accepted a position as vice president and sales manager of another established rubber-importing concern, where he continued in that capacity until the recent formation of S. J. Pike & Co., Inc.

Shortly after the declaration of World War II, Mr. Pike became a consultant to the Board of Economic Warfare, Washington, D. C., where he served for 3½ years.

Changes at Phillips Chemical

The appointment of Amos W. Oakleaf as Phillips Chemical Co.'s sales manager in charge of foreign and domestic sales of furnace blacks, Philblack A and Philblack O, has been announced by K. S. Adams, president of Phillips Petroleum Co., Bartlesville, Okla., and its chemical subsidiary. Mr. Oakleaf, who was graduated from the University of Kansas in 1926 with a B.A. degree in chemistry, joined Phillips in 1944. He will headquarter in the Phillips Chemical sales office at Akron, O.

Raymond J. Hull has been named manager of Philblack export sales, with offices in New York; while George E. Popp has been made manager of domestic and Canadian sales of Philblack.

Mr. Hull was graduated from Purdue University in 1927 with a degree in chemical engineering. He was manager of a tire and tube plant in Holland before joining Phillips. Mr. Popp also held important positions in the tire industry before his association with Phillips in 1945. He will continue his headquarters in Akron.

American Anode, Inc., Akron, O., has developed new latex rubber whistles for use in children's squeeze toys. The new soft, all-rubber whistles take the place of metal and metal-rubber whistles previously used in toys. The metal whistles were easily torn or removed from toys, and many cases were reported where children swallowed the whistle or cut themselves with it. Cylindrical construction of the new rubber whistle can be altered to conform with the base of any rubber latex toy and provides a perfect cementing edge so that the whistle can be retained as part of the toy during its service life. Grooved construction and carefully designed openings of the new whistle are said to give a more pleasing tone than the shrill sounds of metal whistles. The new rubber whistle is being incorporated into rubber crib toys made by a number of manufacturers licensed by American Anode.

Mörlunda Farms Holds Hereford Cattle Auction

Oscar Nelson, president of United Carbon Co., Charleston, W. Va., and Oscar Nelson, Jr., vice president of that company, held the twelfth annual auction of Hereford cattle at their Mörlunda Farms in Lewisburg, W. Va., on October 28. The auction was an outstanding success, attended by some 2,500 people, including about 175 members of the rubber and associated industries, who were guests of the Nelson family at The Greenbrier at White Sulfur Springs for the week-end. Hereford breeders from nine states paid a total of $80,275 for 61 lots of top breeding cattle from the noted herd of Mörlunda Farms. The average price amounted to $1,316 and was the highest average obtained at any Hereford sale in the East since 1945.

The Firestone Farms, Columbiana, O., topped the sale with their purchase of the yearling bull, Mörlunda H. Monarch, for $8,500. This bull is considered one of the greatest young Hereford bulls of the breed, having many championship ribbons to his credit. Mörlunda H. Monarch will be used as the chief herd sire of the select Hereford cattle which Firestone Farms have assembled from many leading breeders throughout the United States.

At a dinner at the Greenbrier on the evening of October 28, given by the Nelson family for more than 400 cattle buyers and breeders and members of the rubber industry, Oscar Nelson, Sr., introduced many of the cattle buyers present, some of whom made informal talks. The main speaker of the evening was Joseph Thomas, secretary and general counsel of the Firestone Tire & Rubber Co., who discussed current business and political trends.

Changes at Hewitt-Robins

Hewitt-Robins, Inc., 370 Lexington Ave., New York, N. Y., has announced the transfer of corporation sales headquarters from Buffalo to New York as a step toward the further integration of the Hewitt and Robins sales organizations.

A realinement in top executive positions was also reported by Thomas Robins, Jr., president.

B. T. Moffatt, corporation vice president, has been elevated to the post of vice president of sales and a director of the corporation. He was in charge of the eastern sales division.

Harold Von Thaden, general manager of the Robins Engineers Division, has been elected a vice president of the corporation. He is also a director of the corporation.

John T. Hoyt was elected to a newly created position of assistant to the president.

Austin Goodyear was made assistant to the vice president of sales.

Edwin M. Perrin, formerly advertising manager of Robins Conveyors Division, was appointed advertising manager of Hewitt-Robins, Inc. He will coordinate the advertising of the four divisions: Robins Engineers, Robins Conveyors, Hewitt Restfoam, and Hewitt Rubber.

A. P. DeVita was named New York district sales manager for Robins Conveyors. Formerly manager of foundry sales and development for Conveyors, Mr. DeVita in his new position will direct and supervise sales in the New York area.

Other appointments in the Hewitt-Robins sales organization include C. A. Thompson as Charleston district sales manager and C. W. Brooks, representative in Northeastern Pennsylvania, transferred to the Virginia-North Carolina sales territory handling both Hewitt Rubber and Robins Conveyors divisions' products.

Forms Sales Affiliate

Kessler Chemical Co., Inc., has organized a sales affiliate, Kessco Chemicals Corp., which will handle sales and distribution of all Kessler products. Maurice J. O'Connor, sales manager of the new firm, makes his office at the plant of the parent company, State Rd. and Cottman Ave., Philadelphia 35, Pa.

L. W. Wasum, vice president of the parent company, has announced that its technical service laboratory is being expanded.

Kessler Chemical produces fatty acid esters, which serve as plasticizers, emulsifiers, defoaming agents, and lubricants in practically every phase of industry.

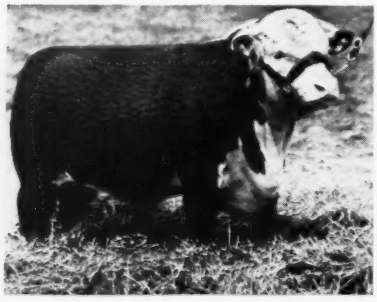
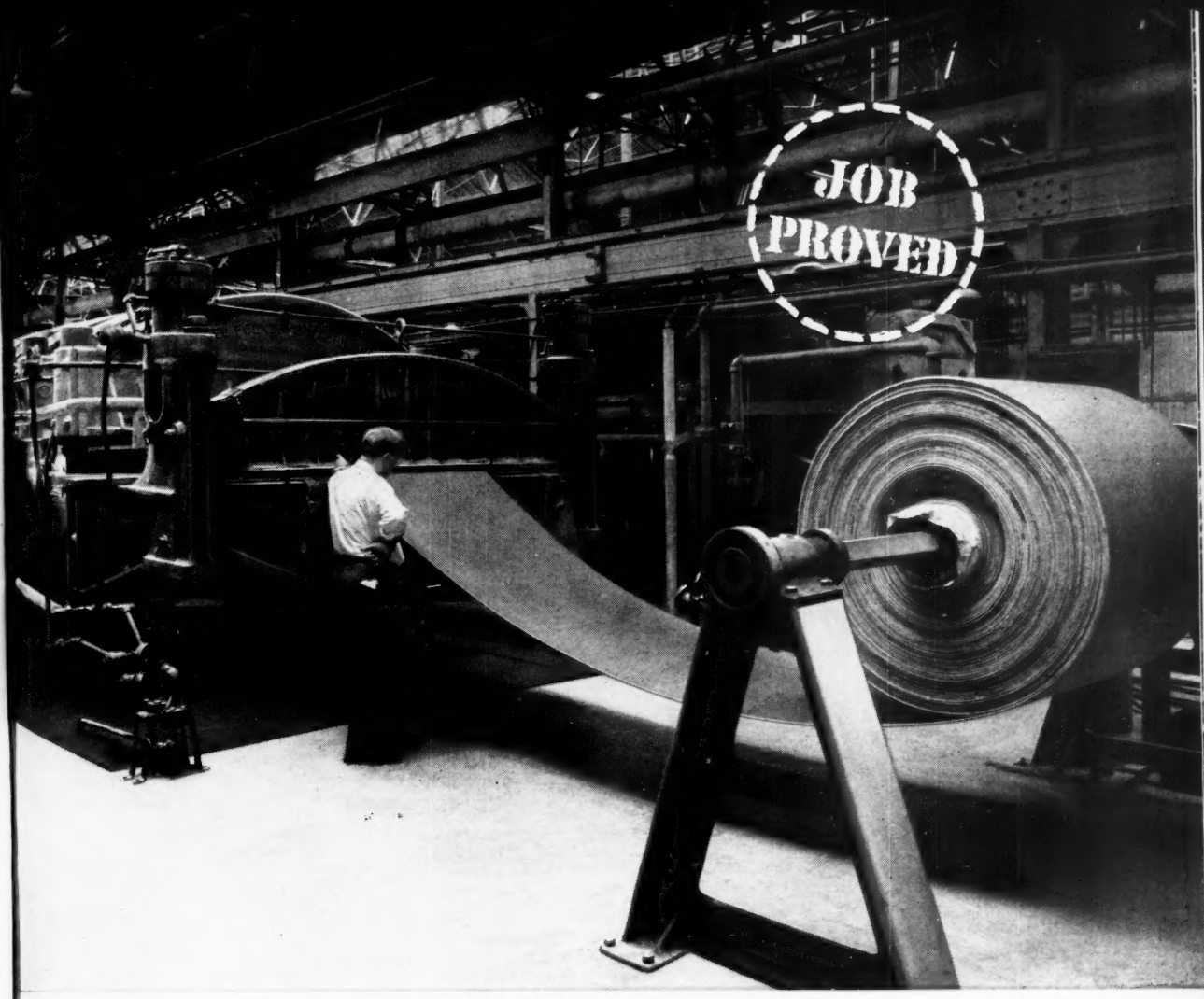


Fig. 1. Mörlunda H. Monarch, Sold to Firestone Farms

Fig. 2. A View of the Barns at Mörlunda Farms on Sale Day



SAVES $6,000 A YEAR IN PROCESSING

2 Sun Rubber-Processing Aids Improve Product Quality, Cut Inventory Costs by Replacing 5 Competitive Aids

A manufacturer of transmission belting and conveyor belts, although turning out high quality material, was not satisfied. He was determined to produce products that were still better, if a way could be found. One possibility lay in increasing resistance to fatigue caused by the millions of rotations of the belts around pulleys.

After discussing the problem with a Sun Engineer, he decided to try Circosol-2XH for his natural rubber and GR-S stocks, and Circo Light Rubber-Processing Aid for neoprene and other synthetics. These gave just the results wanted. In fact, they proved to be so good and so versatile that the five competitive products previously used have been eliminated.

Now, with only two processing aids to buy, the company orders in tankcar lots. Savings are estimated at $6,000 a year.

Sun Rubber-Processing Aids speed up milling and calendering; minimize bleeding and migrating; reduce flex-cracking, heat build-up and hardening. In some cases they even increase the resilience of the finished vulcanizate. These "Job Proved" aids are refined for maximum compatibility with the type of rubber used—natural, synthetic, or reclaim. To learn how Sun Rubber-Processing Aids may help you, call the nearest Sun office. The services of a Sun Engineer are available without obligation.

SUN OIL COMPANY · ***Philadelphia 3, Pa.***
In Canada: Sun Oil Company, Ltd.
Toronto and Montreal

SUN PETROLEUM PRODUCTS
"JOB PROVED" IN EVERY INDUSTRY

SUNOCO

Goodrich Factory Additions

The B. F. Goodrich Co., Akron, O., is adding 14,000 square feet of floor space to its tire factory at Miami, Okla., and 185,000 square feet to the warehouse there and also 87,000 square feet of floor space in a warehouse addition to its tire plant at Tuscaloosa, Ala.

Personnel Promoted

The Goodrich company recently announced the following changes in its replacement tire sales division.

William A. Hays has been made district manager of the New Orleans district, replacing Donald E. Lagarde, transferred to a similar post in Atlanta, Ga. Mr. Hays started with the company 23 years ago as a credit clerk in New York and since 1929 has been serving in various capacities in the New Orleans district, most recently as general supervisor for the district. Mr. Lagarde, also with Goodrich since 1926, saw all his service in the New Orleans district.

Otho B. Bruce has been appointed manager of the Jacksonville, Fla., district, succeeding Walter J. Haecker, resigned. Mr. Bruce has spent 13 years with Goodrich; his most recent position was store supervisor in the Birmingham, Ala., district.

Several changes have been made in the executive staff of the Goodrich engineering division, following the assignment of H. E. Cook, chief engineer for many years, to major engineering problems. These include direction of design and construction and on corporate-wide utility, power and coal company property policy.

Frank Brown has been appointed plant engineer of all Akron plants, and George Murphy to the same post at Plant 4, reporting to Mr. Brown. Clifford R. Augden has been named superintendent of shops, also reporting to Mr. Brown, who formerly held that job.

Kermit R. Sadler has been appointed general traffic manager of the Goodrich company with headquarters in Akron. He comes to his new post after serving since 1943 as manager of traffic and warehousing at the company's Los Angeles, Calif. plant. He has been with the company since 1935, starting in Los Angeles. Mr. Sadler succeeds R. W. Corns, resigned.

John L. Collyer, Goodrich president, has been named to the Munitions Board Advisory Committee on Military-Contractor Relations, it was announced by Secretary of Defense Louis Johnson. Twenty-two other leading business and industrial executives will serve with Mr. Collyer on the Committee.

Goodrich Television Anniversary

The television program of the Goodrich company, "Celebrity Time" celebrated its first anniversary on Sunday, November 6. The program telecast by the American Broadcasting Co. from the Elysee Theatre in New York, N. Y., was attended by Goodrich executives, including President John L. Collyer, many stage, radio, and motion picture celebrities, advertising and public relations agency executives, and members of the press.

The Goodrich television program features Conrad Nagel as master of ceremonies, Ilka Chase and Geraldine Fitzgerald as a women's team and Jack Smart and John Daly as the men's team in a quiz-type show.

Following the telecast, the Goodrich company entertained at a celebrity party on the stage of the theatre.

Trainer before Safety Engineers

J. E. Trainer, vice president in charge of production for the Firestone Tire & Rubber Co., Akron, O., spoke before the annual meeting of the American Society of Safety Engineers in Chicago, Ill., on October 25, on "Safety Engineering and Production."

The Firestone company has received the National Safety Council's Distinguished Service to Safety Award for four consecutive years on a company-wide basis. Mr. Trainer was chairman of the committee on engineering for the President's Conference on Industrial Safety last spring.

"Safety more than pays its way and is a wise investment for every industry," Mr. Trainer said. "A well-conducted safety program also improves the relationship between working force and supervisor and raises employe morale."

Safety engineering's greatest contribution is the prevention of suffering; it contributes to the prevention of damage to equipment and buildings and among its most important contributions is its value as an aid to production. The eight worthy ends safety engineering can accomplish in aiding production were then detailed by Mr. Trainer.

American Cyanamid Co., Calco Chemical Division, Bound Brook, N. J., is constructing a new building that will bring its employes and members of the Piney River community the full-time services of a doctor. For many years the residents of Piney River have traveled long distances to larger centers for medical attention, since their community was too small to warrant the services of a resident physician. As the Calco plant grew in size and new employees and their families settled in the area, the need of a permanent doctor became apparent and was confirmed by a survey by the company's medical department chief, Dr. D. O. Hamblin. The company decided, therefore, to erect a building on its own property and install a competent doctor to take care of the medical requirements of the community as well as its employes. Construction of the new building is well under way, and the services of Dr. E. L. Hirsley have been obtained as resident physician.

John V. Eakin

New Latex Receiving Facilities

General Latex & Chemical Corp., Cambridge 39, Mass., has purchased a bulk latex unloading and storage installation in Baltimore, Md. These facilities supplement the unloading facilities in Boston, Mass., and the bulk storage installation at Cambridge.

As a result of the general increase in business of this corporation and as part of its expansion program, General Latex has purchased the H. A. Astlett Co. latex receiving facilities on the Baltimore & Ohio Railroad, Pier 6, Locust Point, Baltimore. This pier is equipped with the most modern pumping and bulk storage facilities, plus ample floor space for expansion. The facilities will provide a second point of entry for latex shipped to General Latex from Malaya and will forestall any importing difficulties which may be due to tie-ups in either port. It will also provide better service for rubber latex users in the Midwest, Central Atlantic, and Southern states.

General Latex is exclusive agent in the United States for Harrisons & Crosfield, Ltd., producer of high quality centrifuged latex.

Continental Carbon Changes

Ollie Middlebrooks has been appointed general superintendent of the Continental Carbon Co., Sunray, Tex., plant and the Witco Carbon Co., Eunice, N. M., plant. He was formerly superintendent of the Sunray plant.

A. V. Selby has been named purchasing agent at the Amarillo, Tex., office. Succeeding him as office manager of the Sunray plant office is Lewis Hurst.

Armound Swenson, former purchasing agent, has been made general traffic manager, with offices at Amarillo.

Fawick Sales Reorganization

A reorganization of the sales and engineering department of Fawick Airflex Co., Inc., manufacturer of industrial clutches, Cleveland 11, O., was recently announced by R. S. Huxtable, vice president and general manager.

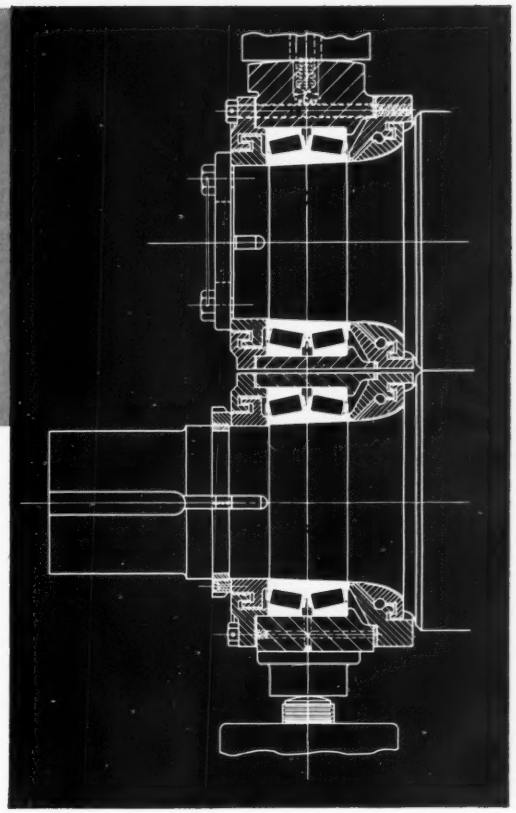
John V. Eakin, formerly southwestern district manager, was appointed assistant sales manager, and J. S. Walsh, assistant chief engineer. J. B. Kelley, formerly director of sales and engineering, has left the employ of the company.

Frank C. Warth was named southwestern district manager with offices in Fort Worth, Tex., and C. H. Lay was made Chicago district manager, with offices in Evanston, Ill.

Mr. Eakin, a graduate of the Mechanical Engineering School at the University of Oklahoma, was associated with National Supply Co. from 1940 to 1943, at which time he joined Fawick in Cleveland. He was later appointed southwestern district manager. He is a member of the American Petroleum Institute, SAE, the Masonic Order, and Phi Kappa Sigma.

Mr. Warth is a graduate of Marquette University, with a BME degree, and was a member of the teaching staff of that school. He served in the Air Corps as a pilot from 1942 to 1946, when he joined the Fawick sales force in Cleveland. He belongs to A.F.M., A.S.M.E., and Omega Sigma Chi.

How Timken® Tapered Roller Bearings Help To Improve Plastics Production --Modify Costs



Timken bearing application for roll necks of plastics and rubber mills.

In plastics mills the use of Timken Balanced Proportion Bearings helps to make mills more rigid, because these bearings make possible larger roll neck diameters, with 50% to 60% increased roll neck strength and correspondingly higher bearing load ratings — up to 40% higher than with previous designs of tapered roller bearings, size for size.

In plastics calenders, where precision is the all-important factor, Timken bearings have proved their ability to provide and hold the extremely close gauge tolerances required in rolling the finest plastic sheet and film.

The advantages and versatility of Timken bearings are made possible by (1) scientific tapered design, (2) ability to carry radial, thrust and combined loads, (3) line contact of rolls and races assuring alignment of revolving parts, (4) superfine surface finish of rolls and races for utmost smoothness of operation and minimum wear.

Make sure you have Timken bearings in the machines you build or buy. Look for the trade-mark "TIMKEN" on every bearing.

THE TIMKEN ROLLER BEARING COMPANY, CANTON 6, OHIO • CABLE ADDRESS "TIMROSCO"

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

TIMKEN 50 YEARS

Smoothing the Path of Progress for 50 Years

NOT JUST A BALL ○ NOT JUST A ROLLER ⊂⊃ THE TIMKEN TAPERED ROLLER ⊂⊃ BEARING TAKES RADIAL ◎ AND THRUST —○— LOADS OR ANY COMBINATION

Gabriel Benzur

Doug C. Cochran

Cochran Forms Latex Concern

Doug C. Cochran has resigned from the Flintkote Co., where he was rubber products manager, to head the recently formed Southern Latex Corp., Austell, Ga. Mr. Cochran previously had also been associated with United States Rubber Co. and Lea Fabrics, Inc.

Directors of the new corporation are Louis Tranger, Willard Lewis, Ellery K. Files, and Mr. Cochran.

Austell is 15 miles northwest of Atlanta, and latex users in the South will now have the advantage of bulk handling facilities and a processing plant centrally located for their needs, resulting in lower transportation costs, faster deliveries, more prompt and effective technical service, and more frequent selling contacts, it was pointed out. Latex compounds specifically designed for Southern textile and paper industries will also result.

Processed latex is now being shipped to the South from the Boston, New York, Philadelphia, and Akron districts. The Austell latex plant will permit year-round deliveries with little possibility of freezing during winter months.

Armstrong Cork Co., Lancaster, Pa., in a graphic full-color page advertisement in the November 19 issue of *The Saturday Evening Post* told the public how "cold rubber" is made. Prepared in cooperation with leading manufacturers of "cold rubber," the advertisement told briefly the chemical process followed in a typical "cold rubber" plant, with a cutaway view and accompanying diagram illustrating the progressive steps in the process. Armstrong is offering 21- by 22-inch enlargements of the view and explanatory diagram to members of the rubber industry and readers of the advertisement. The enlargements are suitable for framing and may be used by the industry in training personnel and in explaining to visitors how a "cold rubber" plant operates.

U. S. Rubber Reclaiming Co., Inc., has discontinued its office at 500 Fifth Ave., New York 18, N. Y., and transferred activities to Buffalo, N. Y., where the company's two plants are located. The move was made to render better service to customers.

Goodyear Appointments

L. D. Hochberg has been appointed superintendent of the Goodyear Tire & Rubber Co. plant at Granville, Australia. He has been director of training for the company since August, 1948. Succeeding him in the latter capacity is T. W. Prior, who served as manager of squadrons for the company since early 1949.

Mr. Hochberg came to Goodyear in 1919 as a production worker, but left the following year to join the Marine Corps. He returned to Goodyear as a member of the training program and in 1929 was made foreman of the squadron. The following year he went to the company's Argentine plant at Buenos Aires, in charge of squadron training. He returned to Akron in 1943, and was named manager of the squadrons, apprentices and Goodyear Hall, two years later. Mr. Hochberg next was appointed assistant general superintendent at the Java, Indonesia, plant early in 1940. He returned to Akron in 1942 as manager of the squadrons' and apprentice school. Then in 1944 he was made superintendent of the Goodyear Fabric Corp., New Bedford, Mass. After the Japanese surrender in 1945, he returned to Java as plant superintendent.

Mr. Prior began his Goodyear career, after his graduation from Ohio Wesleyan University in 1926, as a member of the employment department of the personnel division. He was transferred to the hiring, grievances, and transfers department in 1929, and the following year became manager of office employment. He was placed in charge of office personnel in 1934 and was made manager of the squadrons early this year.

Goodyear has appointed J. O. Horning, Jr., manager of its technical service department in Lima, Peru. A member of the company's technical service department in Akron for the past several years, Mr. Horning joined Goodyear in 1943 following graduation from the University of Louisville. After service on the office squadron, he was transferred to his present department.

John L. Sinclair has been appointed Cleveland, O., district manager of the mechanical goods division. He has been with this division since 1924 when he joined Goodyear at Chicago as a mechanical goods sales clerk. Mr. Sinclair was appointed branch operator at Milwaukee, Wis., in 1930 and was transferred to Atlanta, Ga., in 1932 and to Birmingham, Ala., in 1933.

John K. Hough, director of advertising for Goodyear, last month received a pearl service pin to mark his completion of 35 years with the company. Mr. Hough joined the company in 1914.

He was assigned to the dealer sales department, later transferred to Jacksonville, Fla. as a salesman and next was made district sales supervisor there. He later returned to Akron to become manager of tube sales, then was sent to Boston as service manager. Five years after he joined the company Mr. Hough was named manager of auto tire sales at Los Angeles. Another five years saw him in charge of sales for the eleven western states that comprised the area of the Goodyear-California organization. In 1934 he was recalled to Akron to become assistant manager of tire sales and one year later became managing director of The Goodyear Tyre & Rubber Co. of Great Britain, Ltd., at Wolverhampton, England. He returned to Akron to assume his recent position in October, 1937.

L. D. Hochberg

Tire Developments

The Super-Sure-Grip, said to be the first tire for wide-base rims ever to be designed specifically for garden tractors, has been announced by Goodyear. The new tire is a companion to the wide-base large tractor tire of the same name introduced by the company last summer. Advantages claimed for the new tire are better flotation, greater traction, and improved appearance resulting from the tire's wider and flatter ground contact area. In addition the tire has increased capacity for water filling which gives it more weight. Of two-ply construction, the new tire also has deeper tread design in all sizes. Corresponding to Goodyear's former tire for garden tractor, the 5.00-12 calling for a three-inch rim, is the new 6-12 size built to operate on a five-inch wide rim. The new tire is available in five sizes: 5-12; 6-12; 6-16; 7-16; and 8-16.

Goodyear has also announced a new smooth tread tire, designed primarily for use on corn planters, one of the few farm machines believed still operating largely on steel wheels. The new tire is of 6.50-16 size with two-ply construction. It operates at extremely low pressure, with only two pounds of air recommended. Chief among its advantages, according to Goodyear, is the fact that its smooth tread does not pick up moist or sticky soil, thereby making corn planting less dependent upon dry weather. The smooth tread and low pressure are also less likely to cause soil packing.

A new hydraulic tire remover which should prove a great time and labor saver in changing large earthmover tires has been perfected by Goodyear. Successfully demonstrated to numerous earthmoving accounts, the new tool will operate on any tapered bead rim of Goodyear design. Portable and highly compact, the equipment consists of a ram assembly 19 inches long and weighing 25 pounds, together with a pump and hose, weighing a total of 16 pounds, which provide hydraulic pressure. Under actual test conditions the tool has withstood 18,000 pounds' pressure at one spot on a rim to break the tire bead loose.

Studded Tread bicycle tires, introduced by Goodyear late last winter, should set a high sales figure in the bike trade during the coming winter months, according to M. F. Moyer, manager of the firm's

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cycle tire department. The new tire with its superior gripping qualities and heavier carcass did not become available early enough last winter for its full impact to be registered upon the market. The Studded Tread bike tire is designed especially for use in mud, snow, and other slippery surfaces and is made in three sizes, which are as follows: 20-2.125, 24-2.125, and 26-2.125.

The Smithsonian Institute, Washington, D. C., has installed a permanent display featuring Goodyear's cross-wind landing wheel, it was announced by S. L. Beers, associate curator of the National Air Museum, and T. A. Knowles, vice president and general manager of Goodyear Aircraft Corp. The display includes a comparison of the cross-wind and conventional landing wheels, together with historical and descriptive information on the cross-wind wheel. The display was designed and assembled under the direction of O. W. Loudenslager, who is the Goodyear Aircraft research and development division manager.

Other Goodyear Notes

Latest developments in the use of Goodyear synthetic rubber resins and latices in the paint industry were shown by the company at the annual Paint Industries Show, held November 2-5 at Chalfonte-Haddon Hall, Atlantic City, N. J. Pliolite S-5, a high butadiene-styrene copolymer used as a base for concrete floor enamels, chemically resistant coatings, machinery enamels, and aluminum paints, was also featured as a base for highway traffic paints, stucco and exterior masonry finishes, and wall sealers. Chemigum Latex 101 was displayed as a basic material for rubber emulsion-type paints. Goodyear was represented at the Show by 14 men, under the guidance of H. R. Thies, who is general manager of the chemical division.

Assembly-line production of a wide variety of kitchen cabinets for Montgomery Ward & Co. is now under way in the factories of Goodyear Aircraft Corp. at Akron, O., according to T. A. Knowles, company vice president and general manager. Fourteen different items of both floor- and wall-type cabinet models are being produced on a mass assembly basis utilizing an overhead conveyer system almost 2,000 feet long. Complete forming, spotwelding, finishing, final assembly, and packaging operations on the cabinets are being performed, with approximately 300 of Goodyear Aircraft's present personnel devoting either full or part time to the production schedule.

The latest innovation in hotel courtesies, appreciated particularly by women travelers, is a tight fitting hair protector to be used in tub or shower to protect milady's coiffure. Recently introduced in a number of leading hotels, the Plasticap has met with almost unanimous enthusiasm by hotel operators as well as guests because of its low cost and resultant savings in use and wear of towels. Made of water-proof Pliofilm manufactured by Goodyear, the hair protectors are fabricated and marketed by Plasticap, Inc., Dallas, Tex.

A new type of press roller that will not support fire has been announced by Goodyear's mechanical goods division. Besides its fire resistant safety quality that will greatly reduce the danger of costly press room fires, the new roll will not swell under the action of oily inks. It is further claimed that the new roller will retain its original hardness throughout its life, will keep proper resilience, and will require less regrinding than ordinary rollers.

Western Sporting Goods Dealers' Association held its convention and show at the Palace Hotel, San Francisco, Calif., November 6-9. Among the manufacturers scheduling exhibits were: Athletic Shoe Co., Converse Rubber Co., and Wilson Sporting Goods Co., all of Chicago, Ill.; Boston Athletic Shoe Co. and Burke Golf, Inc., as represented by Curley-Bates Co., San Francisco; Brooks Shoe Co., as represented by James B. Dick Co., Los Angeles, Calif.; Johnson & Johnson, New Brunswick, N. J.; Plastic Fabricators, Inc., as represented by Dick Larson Sales Co., Los Angeles; Hyde Athletic Shoe Co., as represented by Don Morrill Co., Fresno, Calif.; Seamless Rubber Co., New Haven, Conn.; and W. J. Voit Rubber Co., Los Angeles.

OBITUARY

A. Boyd Cornell

ALVAH Boyd Cornell, executive vice president and general manager of Hamilton Rubber Mfg. Corp., Trenton, N. J., died of a cerebral hemorrhage on November 7 in a Philadelphia hospital. He was interred November 10 at Ewing Church Cemetery, Trenton, following services at Ivins & Taylor Funeral Home.

Born in Trenton on January 1, 1879, Mr. Cornell attended Trenton Model School and Mount Hermon Preparatory School, Mount Hermon, Mass., and was graduated from Princeton University in 1901 with a B.S. degree.

That same year he joined the Empire Rubber & Tire Co., Trenton, and was secretary when he resigned in September, 1917. It was then that he began his long association with Hamilton Rubber Mfg. Co. He successively became general manager of the company in March, 1918, secretary and general manager, treasurer and general manager, and president. In 1946 when Hamilton was taken over by Albert M. Kahn and incorporated, Mr. Cornell became executive vice president of the reorganized concern, Hamilton Rubber Mfg. Corp. The deceased was also a director of Acme-Hamilton Mfg. Corp. and of Crescent Insulated Wire & Cable Co.

A charter member and past president of the Rubber Manufacturers Association of New Jersey, Mr. Cornell was also a member of the executive committee of The Rubber Manufacturers Association, Inc., a director of Mercer Hospital, Trenton, past president of Trenton Club, a director of Trenton Country Club, and a member of the Princeton Clubs of Trenton and New York.

Mr. Cornell leaves his wife, his brother, and several nieces and nephews.

Charles E. Brown, Jr.

THE vice president and general sales manager of the Okonite Co., Passaic, N. J., Charles E. Brown, Jr., died November 8 in New York, N. Y., following a long illness. He was 55 years old.

The deceased, son of the late Charles Edward Brown, an executive vice president of Okonite, was born in Buffalo, N.Y. Before going to Princeton University, from which he was graduated in 1917, he had attended St. Mark's School, Southborough, Mass. During World War I he was an army aviator.

Mr. Brown's business career began with the Central Electric Co. of Chicago. In 1925 he joined Okonite as Chicago manager of its light and power department and in 1930 moved to New York to become assistant to the company's president. In 1941 the deceased was appointed a vice president of Okonite and Okonite-Callender Cable Co., serving as company representative in the Washington office which he had established some time before. In 1946 he returned to New York and became vice president and general sales manager, the positions he held at the time of his death.

A member of the American Institute of Electrical Engineers and the American Society of Naval Engineers, Mr. Brown also belonged to the Racquet & Tennis Club, the Princeton Club of New York, the Chicago Club of Chicago, the Ivy Club of Princeton, and the Pennington Club.

Funeral services were held November 9 at St. James Protestant Episcopal Church in New York, followed by burial on November 10 at Lake Forest, Ill.

Surviving Mr. Brown are the widow, a daughter, two sons, a sister, and a brother.

Albert F. Tallmer

ALBERT F. TALLMER, secretary-treasurer and a director of U. S. Rubber Reclaiming Co., Inc., New York, N. Y., until his retirement a few months ago, died October 26 after a long illness. Funeral services and burial were on October 27.

The deceased was a member of the New York Rubber Group, the Crude Rubber Group, and National Credit Office, Inc.

Mr. Tallmer was born in Richmond, Va., in 1890.

In 1906 he began his long association with U. S. Rubber Reclaiming as an office boy. He eventually turned to selling reclaimed rubber and in 1943 was named secretary of the company after having served as assistant secretary.

Surviving are two sons, a sister, and a brother.

Samuel C. Clark

SAMUEL CLYDE CLARK, co-founder and chairman of the board of the Baldwin Rubber Co., Pontiac, Mich., died November 8 following a long illness. Funeral services were held on November 12 in Pontiac, followed by burial at White Chapel Memorial Park.

Mr. Clark's early associations with the rubber industry were with the B. F. Goodrich Co. and Firestone Tire & Rubber Co., both in Akron, O. In 1924 the deceased and Russell H. Baldwin organized the Baldwin Rubber Co. In 1929, after having served as production manager of the company, Mr. Clark became president and general manager, retaining those positions until 1946, when he became chairman of the board of directors.

Mr. Clark was also a director of the Michigan Manufacturers' Association and was very active in the civic organizations of Pontiac.

He was born on March 29, 1886, at Millersburg, O., where he attended grade and high schools.

Surviving are the widow and two sisters.

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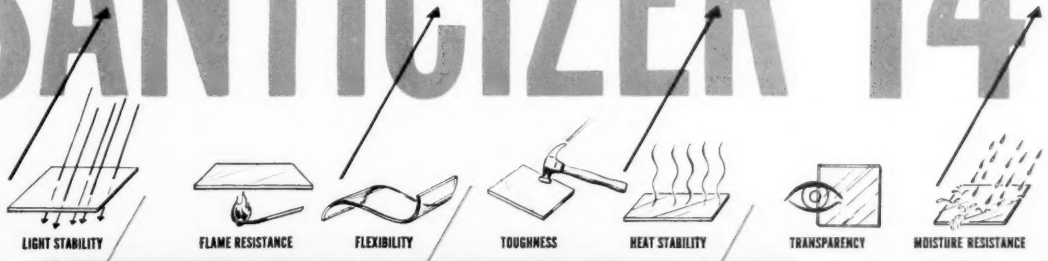

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NEWS ABOUT PEOPLE

John N. Street

Charles A. Walmsley

John N. Street has been appointed director of chemical laboratories of The Firestone Tire & Rubber Co., Akron, O. Prior to the war Dr. Street was in charge of the company's synthetic rubber development program and during the war served as Firestone's representative on the government's synthetic rubber technical committee, which later became the research and development group under the Rubber Director. In 1945, Dr. Street was one of the industry representatives sent to Europe by Rubber Reserve to investigate German work on synthetic rubber. The discoveries of this committee led to the practical development in this country of cold rubber in 1945-1946 while Dr. Street was manager of research and development of the ORR. Dr. Street joined Firestone as a research chemist in 1926, became director of chemical and physical research in 1936, and was named assistant director of chemical laboratories in 1944.

Langley W. Isom has been appointed assistant to the general manager of Heveatex Corp., Melrose, Mass. Mr. Isom has been connected with the rubber latex industry for some twenty years. His most recent position was that of sales manager of the rubber specialties division of Dewey & Almy Chemical Co. Previously he had been engaged in latex research with the same concern. He is co-inventor of several processes and devices pertaining to latex and latex meteorological balloons. A graduate of Columbia University, Mr. Isom continued his technical education in the chemical engineering department of Massachusetts Institute of Technology, from which he received the M.S. degree in 1930.

G. W. McCullough, vice president and general manager of Phillips Chemical Co., Akron, O., was a guest speaker at the recent fourth annual short course on instrumentation for the process industries at Texas Agricultural & Mechanical College. Mr. McCullough, the author of several papers on instrumentation and control of process, spoke on "Economics of Instrumentation."

Charles A. Walmsley has been named vice president in charge of production for Cameron Machine Co., 61 Poplar St., Brooklyn 2, N. Y., manufacturer of slitting and rewinding machinery. He joined Cameron in June, as special assistant to the president and later became head of production. Prior to his association with Cameron, Mr. Walmsley was connected with International Derrick & Equipment Co. as works manager. He is a graduate of Pratt Institute, School of Science and Technology, with a degree in electrical engineering and of Poppenhusen Institute; he also attended Bonaventure College.

Irving Langmuir, associate director of the General Electric research laboratory at Schenectady, N. Y., on October 27 became the second American scientist to receive the Mascart Medal, awarded triennially by the French electrical engineering society, the Société Française des Electriciens, to a scholar or engineer in any country "who is distinguished by an ensemble of works on pure or applied electricity." The award to Dr. Langmuir, for the year 1948, was made at a dinner at the Mohawk Golf Club, with C. G. Suits, G-E vice president and director of research, presiding. The French organization had asked the American Institute of Electrical Engineers to make the presentation.

James L. Hayes has been chosen president of Inland Rubber Corp., tire manufacturer since 1913, Chicago, Ill. Mr. Hayes, who has served 12 years with Inland, 10 of them as vice president, succeeds William M. Collins, Jr., resigned. Inland Rubber markets its "Air Glide" and "Heavy Service" tires and tubes and repair materials nationally through independent automotive distributers and dealers.

Ray P. Johnson has been named administrative assistant to G. A. Shallberg, executive vice president of Borg-Warner Corp., Chicago, Ill. Besides Mr. Johnson continues as vice president of Morse Chain Co., a Borg-Warner division, and as a director of Borg-Warner.

Lorin B. Sebrell, who has been connected with research and development work in the rubber industry for 30 years, mostly with the Goodyear Tire & Rubber Co., has been appointed a member of the staff of The Firestone Tire & Rubber Co.'s chemical research division. Dr. Sebrell is considered one of the outstanding leaders of research and development in the rubber and plastics field, having pioneered in the discovery of many new chemicals and other products. He is a past chairman of the Division of Rubber Chemistry of the American Chemical Society, as well as a recipient of the Charles Goodyear award of this society for outstanding scientific contributions.

Frank R. Plum has been made director of sales of the bakery division of American Machine & Foundry Co., 511 Fifth Ave., New York 17, N. Y. Among the products whose sales Mr. Plum will supervise are mixers for the rubber industry.

James E. MacDonald, Jr., of Goodall Rubber Co., Inc., is heading the rubber division of the commerce and industry section of the Greater New York 1950 March of Dimes.

Jack H. Rines, who recently joined Pioneer Latex & Chemical Co., Middlesex, N. J., will be concerned with technical sales of new products being developed by the company. Mr. Rines, a graduate of Cornell University, was with the Flintkote Co., rubber products division, for several years; he resigned in 1943 to become manager of rubber reclaiming operations at Essex Rubber Co., Trenton, N. J. The next year, however, he went to B. F. Goodrich Chemical Co., Cleveland, O., as staff representative and assistant to the sales manager of the Hycar rubber and rubber chemicals department. Mr. Rines belongs to the American Chemical Society, Division of Rubber Chemistry, and the New York and Akron Rubber groups.

J. G. Hagey, of The B. F. Goodrich Rubber Co. of Canada, Ltd., Kitchener, Ont., Canada, recently was elected executive vice president for 1949-50 of the Association of Canadian Advertisers.

Trade Lists Available

The Commercial Intelligence Branch, United States Department of Commerce, Washington, D. C., recently compiled the following trade lists, of which mimeographed copies may be obtained by American firms from this Branch and from Department of Commerce field offices at $1 a list for each country.

Automotive Equipment Importers & Dealers—Canada; Canary Islands; Indo-China; Iraq; New Zealand.

Boot & Shoe Importers & Dealers—British Guiana; Dominican Republic; Italy; Trinidad.

Boot & Shoe Manufacturers—El Salvador.

Chemical Importers & Dealers—Australia; Ecuador; Netherlands.

Electrical Supply & Equipment Importers & Dealers—Haiti; Iraq; Italy; New Zealand; Switzerland.

Office Supply & Equipment Importers & Dealers—British Malaya; Portuguese East Africa.

Plastic Material Manufacturers & Molders, Laminators & Fabricators of Plastic Products—Peru.

Rubber Goods Manufacturers—Egypt; Norway; Belgium.

Rubber Goods Manufacturers & Exporters—Japan.

Rubber Growers & Exporters—Brazil.

Sporting Goods, Toy & Game Manufacturers & Exporters—Western Germany.

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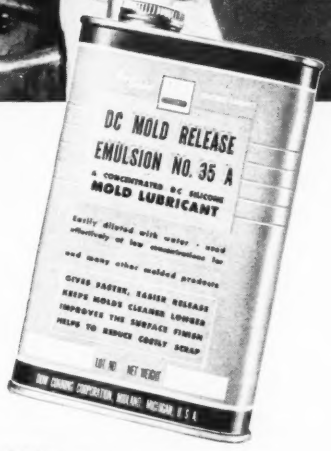
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APPLICATION

United States

2,483,636. **Rubber Fountain Syringe Bag to Be Folded into a Compact Form.** R. F. Hardesty, West Medford, assignor to Davidson Rubber Co., Charlestown, both in Mass.

2,483,680. **Collapsible Bird Decoy with an Inflatable Rubber Body.** R. L. Timm and L. L. Hartshorn, both of Minneapolis, Minn.

2,483,716. **Endless V-Belt Having at Least One Covering Layer Formed of a Single Cord Wrapped Helically around the Belt.** T. F. White, assignor to Gates Rubber Co., both of Denver, Colo.

2,483,734. **Pyramid Highway Marker with Resilient Walls.** H. E. Neal, Columbus, assignor to Plastic Engineering Co., Inc., Cleveland, both in O.

2,483,754. **Composite Assembly Including a Vulcanized Rubber Mass Bonded to Brass by Having at Least a Portion of the Rubber Mass Mixed with Silica Aerogel Particles.** M. Clifton, Detroit, Mich., assignor to United States Rubber Co., New York, N. Y.

2,483,806. **Concrete Composition Containing an Emulsion of High-Molecular Weight Thermoplastic Organic Material Dispersed in Water, and Containing a High-Molecular-Weight Lignin Derivative of Waste Sulfate Black Liquor.** W. D. Buckley, Berkeley, and P. E. McCoy, assignors, by mesne assignments, to Stancal Asphalt & Bitumuls Co., both of San Francisco, both in Calif.

2,483,851. **Syringe.** C. V. Smith, New York, N. Y.

2,484,045. **Adhesive Bandage.** B. D. Morgan, Fords, N. J., assignor to Johnson & Johnson, a corporation of N. J.

2,484,125. **Elastic Fabric.** A. Silvain, Roubaix, France.

2,484,232. **For Aerating Bottles or the Like, a Valve Structure Including a Flexible Element.** W. B. Kochner, assignor, by mesne assignments, to Knapp-Monarch Co., both of St. Louis, Mo.

2,484,265. **Cross-Stretch Foundation Garment.** C. Brown, New York, N. Y.

2,484,289. **In Apparatus for Attaching Soles to Shoes, a Base Member for Supporting the Sole Including a Hollow Liquid-Filled Pad of Rubber.** E. A. Hammarsjo, assignor to Elfon & Co., Ltd., A. B., Stockholm, Sweden.

2,484,356. **Portable Urinal.** L. P. Ribeiro and H. W. Ribeiro, both of Saylorsburg, Pa.

2,484,397. **Practice Golf Ball.** B. C. Barton, Clifton, N. J., assignor to United States Rubber Co., New York, N. Y.

2,484,401. **In a Crutch, a Resilient Tip Including a Flanged Adapted and a Semi-Spherical Shoe of Resilient Material.** W. R. Cole, Des Moines, Iowa.

2,484,468. **In a Jet-Propelled Airplane Toy Including Tubular Arms Carried by a Hub and Connected with an Air Chamber, Flexible Tubes Connected with the Arms and Carrying Airplanes.** T. A. Schaad, Detroit, Mich.

2,484,531. **Attachable Handle for Vessels Held in Place by a Knobbed Suction Cup to Which Is Secured an Elastic Band.** M. Simmons, Detroit, Mich.

2,484,563. **Rubber Hair Curler.** L. J. and M. R. Hall, both of Middletown, N. Y., assignors to Damosel, Inc., a corporation of N. Y.

2,484,608. **Container Consisting Entirely of Insulation and Rubber Hydrochloride Film.** La V. E. Cheyney and R. J. McCutcheon, assignors to Wingfoot Corp., all of Akron, O.

2,484,620. **Flexible Protective Cushion for Tire Chafer Area.** E. W. Glen, assignor to Wingfoot Corp., both of Akron, O.

2,484,696. **For Milking Machines a Teat Cup Including a Rigid Outer Shell and an Elastic Teat-Receiving Inner Shell.** L. Dinesen, Minneapolis, Minn.

2,484,705. **Buna Compound Containing Magnesia for Adhesion to Copper Alloy Surfaces.** A. N. Gray, Joppa, Md., assignor to Western Electric Co., Inc., New York, N. Y.

2,484,787. **Storage Battery Plate of Layers of Glass Fibers and a Microporous Septum of Fibers of Thermoplastic Synthetic Resin.** J. A. Grant, Grantville, O., assignor to Owens-Corning Fiberglas Corp., a corporation of Del.

2,484,810. **Spinning Apron Consisting of an Inner Wear-Resisting Layer of Tough Carbon-Black-Reinforced Rubber, and an Outer Layer of Softer, Carbon-Black-Free Rubber with a Layer of Nylon Cords Embedded between these Layers.** H. M. Bacon and J. Rockoff, assignors to Dayton Rubber Co., all of Dayton, O.

2,484,832. **In a Sharp Freezing Container, Partitions of Easily Distorted Rubber, the Surface of Which Is the Reaction Product of Rubber Treated by Immersion in a Liquid Mixture of Sulfuric Acid and Glycerol.** H. Y. Jennings, Clio, assignor to Copeman Laboratories Co., Flint, both in Mich.

2,484,876-877. **In Machines for Molding Shoe End Portions and Uppers, Bands or Sheets of Elastic Material to Conform such Portions or Uppers to the Contours of Formers.** M. L. Dodge, Newburyport, Mass.

2,484,898. **Toy Spur Having a U-Shaped Body and Imitation Rowel of Rubber-Like Material.** J. L. MacDonald, Fort Myers, Fla.

2,484,924. **Detachable Fluid Valve Coupling Including an Expandable Gripper of Resilient Material Carried by a Housing.** E. M. Anderson, Westbrook, Me., assignor to Utilities Distributors, Inc., a corporation of Me.

2,484,947. **Step Covering Formed of Resilient Thermosetting Resin-Impregnated Fabric Material.** R. H. Hocutt, Charlotte, N. C., assignor to Southern Friction Materials Co., a corporation of N. C.

2,485,011. **In a Fluid Seal Including a Cylindrical Shell Having an Annular Wall, a Grease Retaining Member of Soft Grease-Resistant Elastomer to Which Is Bonded an Annulus of Harder and Less Resilient Grease Resistant Elastomer.** P. F. Niessen, and R. G. Welk, assignors to Victor Mfg. & Gasket Co., all of Chicago, Ill.

2,485,068. **Brush Cover Including a Sheath of Airtight Pliable Elastic Material.** A. H. Santana, Baltimore, Md.

2,485,304. **Roller Skate Wheel of Closely Laminated Layers of Rubber and Fabric Impregnated with Thermosetting Synthetic Resin, of Which Latter Material the Outer Layers Are Composed.** E. S. Marsh, Watford, England.

2,485,307. **Nonslip Rug Pad Fabric Including Independent Main Body Yarns Formed of Resilient Material and Coated with Latex.** M. Newman, Philadelphia, Pa.

2,485,420. **Shuttlecock with a Body of Elastic Material.** A. M. Timpe, Los Angeles, Calif.

2,485,458. **In Strong and Flexible Dielectric Sheets, Asbestos Fibers Bonded with Polyvinyl Resin.** R. G. Quinn, Bound Brook, and J. C. Harkness, Manville, both in N. J., assignors to Johns-Manville Corp., New York, N. Y.

2,485,686. **Hair Curler Including a Pair of Y-Shaped Flexible Elastic Members.** R. Bacon, Brooklyn, N. Y.

2,485,725. **Elastic Textile Fabric Having a Continuous Film of Thermoplastic Elastomer Thermally Bonded to Superficial Portions of at Least One Surface of the Fabric.** C. S. Francis, Jr., West Harwich, Mass., assignor, by mesne assignments, to American Viscose Corp., Wilmington, Del.

2,485,827. **Propeller for Aircraft Including Layers of Fabric of Different Weights Embedded in a Thermosetting Resin.** R. N. Hartzell, assignor to Hartzell Industries Inc., both of Piqua, O.

2,485,898. **Inflatable Core for Use in Casting Hollow Concrete Units.** C. B. Mathews, Ilkley, and J. G. Ambrose, Fossebridge, both in England.

2,485,899. **Combined Brush and Sponge Device Including a Sheet of Sponge Rubber and a Second Rubber Sheet Having a Bristle Face.** J. McBreen, Albany, N. Y.

2,485,957. **In Apparatus for Treating Collagen Strands, an Independently Driven Vertical Endless Rubber Belt.** A. Cresswell, Stamford, Conn., assignor to American Cyanamid Co., New York, N. Y.

2,485,996. **Rubber Hot Water Bag and Closure.** D. Atkin, London, England.

2,486,078. **Flexible Coupling for a Disk Grinder Including a Substantial Median Resilient Cushion.** B. Tocci-Guilbert, assignor to Flexentrik Co., San Francisco, Calif.

2,486,099. **In a Mechano-Electric Transducer Including a Driving Member Supported by Bearing Members, Flexible Elastic Bushings between the Bearing Members, and a Flexible Elastic Fulcrum Member Attached to the Driving Member.** B. B. Bauer, Oak Park, Ill., assignor, by mesne assignments, to Shure Brothers, Inc., Chicago, Ill.

2,486,113. **In a High-Pressure Coupler, a Sealing Member of Rubber-Like Material.** T. A. Campbell and E. G. Stock, assignors to Stewart-Warner Corp., all of Chicago, Ill.

2,486,158. **Inflatable Kite.** M. Haas, Brooklyn, N. Y.

2,486,320. **Mixing Bowl Cover Having an Elastic Collar Adapted to be Stretched over the Rim of a Bowl and an Elastic Collar for the Shank of a Mixing Utensil.** M. J. Ost, Mountainside, N. J.

2,486,364. **Bottle Closure of Soft Rubber Including a Body Including a Valve Structure.** E. Simmons, New York, N. Y., assignors to Pyramid Rubber Co., Ravenna, O.

Dominion of Canada

459,976. **Resilient Vibration Absorbing Mounting.** L. Wallerstein, Jr., assignor to Lord Mfg. Co., both of Erie, Pa., U.S.A.

460,065. **Preformed, Resilient Packing Sleeve for Pistons, Shafts, Etc.** J. H. F. Stewart, Detroit, Mich., U.S.A.

460,072. **Resilient Rubber Cylinder as Vibration Reducing Mounting for Motor Plate.** E. V. Schneider, assignor to Alliance Mfg. Co., both of Alliance, O., U.S.A.

460,108. **Sheet of High Molecular Weight, Water-Insoluble Material, at Least One Surface of Which Is Treated with a Non-Aqueous Solution of Tetraethyl Orthosilicate to Improve Slippage Characteristics of the Sheet.** R. P. Easton, Binghamton, assignor to General Aniline & Film Corp., New York, both in N. Y., U.S.A.

460,205. **In a Shoe, a Rubber Outer Sole Vulcanized to a Rubber Foxing and the Inner Sole of the Shoe.** J. Hoza, Belcamp, Md., U.S.A.

460,255. **Ironing Board Pad Including a Layer of Sponge Rubber Enclosed in a Flat Watertight Bag or Skin.** B. H. Foster, Maplewood, N. J., U.S.A., assignor to Dominion Rubber Co., Ltd., Montreal, P.Q.

460,322. **Cushioning Device of Resilient Material for Radiation Detector.** G. Herzog, Houston, Tex., assignor to Texaco Development Corp., Wilmington, Del., both in the U.S.A.

460,447. **In a Fastening Device Including a Body Member Having a Threaded Bore, an Insert of Elastic Plastic Material.** R. E. Hedlund, Quincy, Mass., executrix of the estate of W. T. Hedlund, deceased, in his lifetime of Summit, assignor to Elastic Stop Nut Corp. of America, Union, both in N. J., both in the U.S.A.

460,450. **Tire Construction.** C. C. Dybvig, Birmingham, Mich., assignor to Firestone Tire & Rubber Co., Akron, O., both in the U.S.A.

460,452. **Rubber-Covered Accelerator Pedal.** C. P. Pinardi, Dearborn, and D. L. Poole, Detroit, both in Mich., both in the U.S.A., assignors to Ford Motor Co. of Canada, Ltd., Windsor, Ont.

460,519. **Golf Club Head of Molded Ethyl Cellulose.** E. J. Marciniak, Easthampton, and E. P. Kearsley, Springfield, both in Mass., U.S.A.

460,544. **Rubber-Like Conduit Guide Device for Vehicles.** J. B. Parsons, Toledo, O., U.S.A.

460,635. **Rubber Pad in a Motor Driven Rubbing Machine.** S. A. Crosby, assignor to Sterling Tool Products Co., both of Chicago, Ill., U.S.A.

United Kingdom

628,466. **Coated Thread or the Like of Synthetic Linear Polyamide Resin.** S.p.A. Lavorazione Materie Plastiche.

628,489. **Eraser Devices.** Parasor A. G.

628,512. **Hot Water Bottles and Icebags of Rubber or Like Material.** D. Atkin.

628,781. **Electric Cables for High-Frequency Currents.** British Insulated Callender's Cables, Ltd., and H. J. Dixon.

628,889. **Inflatable Articles.** Dunlop Rubber Co., Ltd., and J. Jones-Hinton.

628,911. **Handles for Tools and Other Articles.** Dunlop Rubber Co., Ltd., R. M. Seddon, and G. H. Goulding.

628,959. **Fluid Pressure Valves.** Dunlop Rubber Co., Ltd., and H. Trevaskis.

629,129. **Fluid-Tight Casings for Submarine Cables.** Siemens Bros. & Co., Ltd., A. Rosen, and D. G. Fee.

629,133. **Pneumatic Tires and Wheels.** G. Hinson-Rider.

629,212. **Resiliently Supported Bolster of Bogie Carriages of Railway and Like Vehicles.** Metalastik, Ltd., and A. J. Hirst.

629,338. **Badminton Rackets or Similar Sports Articles.** Dunlop Rubber Co., Ltd., and G. Vaughan.

629,434. **Casters.** British Tire & Rubber Co., Ltd., W. N. Evans, and J. W. Davison.

629,470. **Nipples or Comforters for Babies.** F. A. Middleton.

629,675. **Supporters for Elastic Stockings.** G. H. Roberts.

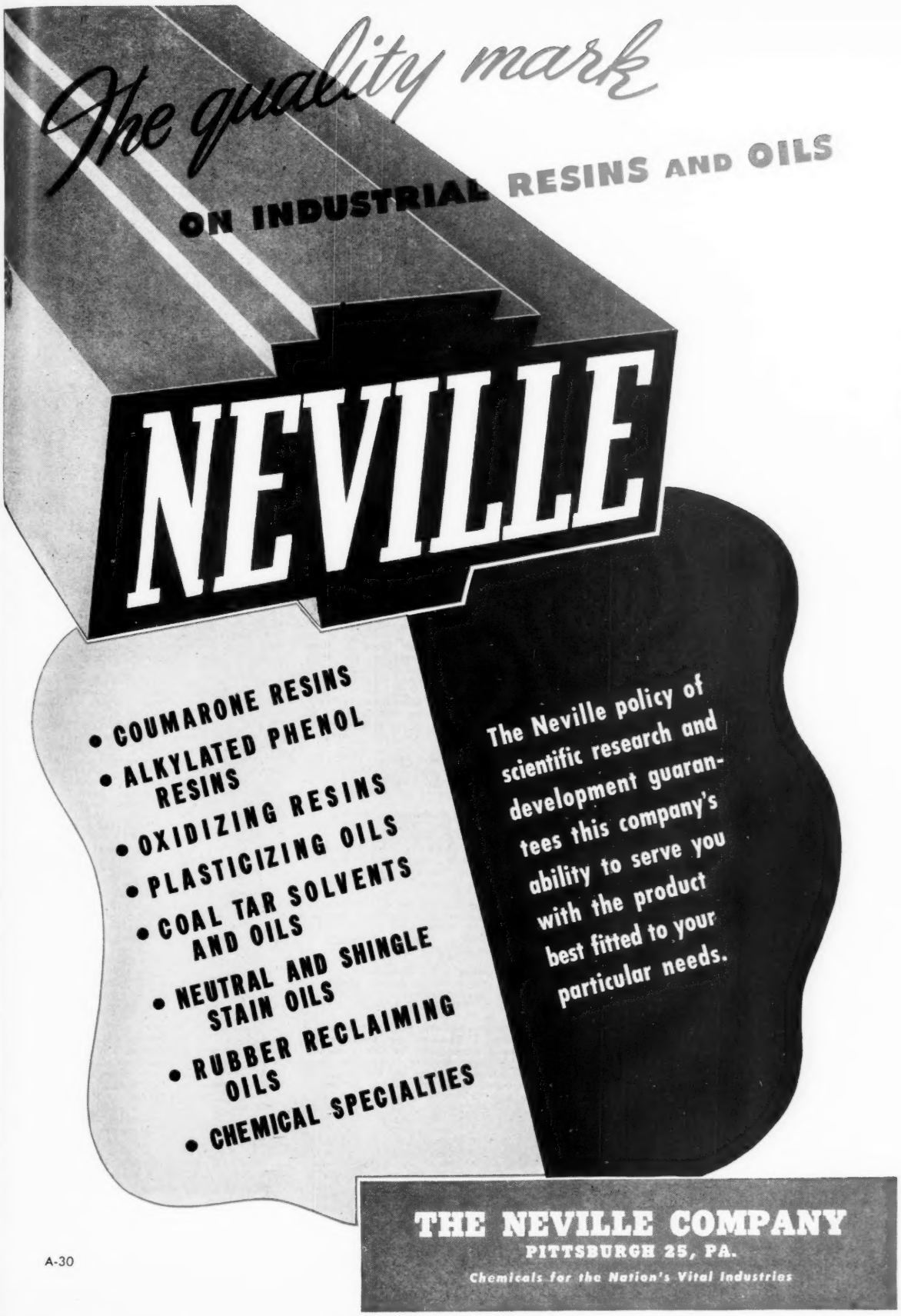
629,846. **Inflatable Cores for Use in Casting Hollow Concrete Units.** C. B. Mathews and J. G. Ambrose.

629,905. **Brake Disk for Airplanes and Other Vehicles.** Dunlop Rubber Co., Ltd., and H. J. Butler.

630,012. **Tire and Rim Assembly.** R. G. Letourneau, Inc.

630,141. **Vehicle Wheels.** Dunlop Rubber Co., Ltd., and E. S. Birbeck.

630,282. **Resilient Wheels.** Svenska Aktiebolaget Broms Regulator and J. M. Archambault.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PROCESS

United States

2,484,340. **Article Cover of Flexible Sheet Material.** C. E. Gardner, Queens, N. Y., assignor to Gardner Industrial Associates, Inc., Middlesex, N. J.

2,484,484. **Polytetrafluoroethylene Laminated Products.** K. L. Beery, Hockessin, assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, both in Del.

2,484,743. **In Manufacturing a Slip-Lasted Shoe, Vulcanizing Thermosetting Reinforcing Element and Counter to the Upper.** H. W. Rollman Waynesville, N. C., and E. E. Rollman, Los Angeles, Calif.

2,484,965. **Collapsible Tubes from Thermoplastic Resin.** C. E. Slaughter, New Canaan, assignor to Extruded Plastics, Inc., Norwalk, both in Conn.

2,485,072. **Heat-Treating Thermoplastic Fabric by High-Frequency Current.** W. H. Shields, Grand Rapids, Mich.

2,485,238. **Producing a Desired Surface on a Thermoplastic Sheet.** W. H. Hickok, assignor to Girdler Corp., both of Louisville, Ky.

2,485,691 **Extruded Polytetrafluoroethylene Articles.** S. B. Bogese, Upper Montclair, N. J., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

2,485,746-747. **Producing a Knitted Fabric from Elastic and Inelastic Yarns.** R. F. W. Krueger, Cleveland, O., assignor to Bamberger-Reinthal Co., a corporation of O.

2,485,798. **Polymerization Process.** S. and D. D. Whyte, both of New York, N. Y., S. Whyte assignor to D. D. Whyte.

2,485,896. **Shaping Articles of Methyl Methacrylate Resin.** H. J. Lucas and F. R. Hepner, both of Pasadena, Calif., assignors to The United States of America, as represented by the Secretary of the Navy.

2,485,967. **Patent Leather or Simulated Patent Leather.** A. B. Harding, Stoneham, Mass., assignor to Monsanto Chemical Co., St. Louis, Mo.

2,486,258. **Flexible Films Bearing Designs.** M. A. Chavannes, Lisbon, Conn., assignor to Chavannes Industrial Synthetics, Inc., New York, N. Y.

2,486,259. **Frinting on Thermoplastic Sheetlike Material.** M. A. Chavannes, Lisbon, Conn.

Dominion of Canada

459,952. **Manufacturing a Separate Balloon Section for an Inflatable Catheter.** J. M. Auzin, assignor to Davol Rubber Co., both of Providence, R. I., U.S.A.

459,953. **Improving the Physical Properties of a Yarn Composed of a Polymer Containing a Major Proportion of Acrylonitrile.** S. Silverman, Silver Spring, Md., U. S.A., assignor to Canadian Industries, Ltd., Montreal, P.Q., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., U.S.A.

460,004. **Plasticizing Vulcanized Conjugate Diolefin Polymer.** J. C. Elgin, Princeton, N. J., and E. F. Sverdrup, assignors to U. S. Rubber Reclaiming Co., Inc., both of Buffalo, N. Y., both in the U.S.A.

460,111. **Molding a Sealing Element Directly upon a Series of Spaced-Apart Fastener Elements.** C. P. Krupp, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y., both in the U.S.A.

460,148 **Shaped Rubber Articles.** C. J. Crowley, assignor to Seamless Rubber Co., both of New Haven, Conn., U.S.A.

460,177. **Manufacturing Cast Film Sheeting and the Like of Vinyl-Type Resin by the Continuous Process.** A. J. Seitz, assignor to Wingfoot Corp., both of Akron, O., U.S.A.

460,178. **Splicing Butyl Rubber.** F. F. Silver, assignor to Wingfoot Corp., both of Akron, O., U.S.A.

460,267. **Processing Rubber Compound.** H. H. Waters, assignor to Firestone Tire & Rubber Co., both of Akron, O., U.S.A.

460,460. **Molding Thermoplastic Material.** N. Lester, assignor to Lester Engineering Co., both of Cleveland, O., U.S.A.

460,575. **Imparting Surface Effects to Thermoplastic Sheets.** T. M Knowland, Belmont, assignor to Boston Woven Hose & Rubber Co., Cambridge, both in Mass., U.S.A.

460,614. **Insoluble Resin-Bonded Coated Abrasive Articles.** R. Marchant, assignor to Minnesota Mining & Mfg. Co., both of St. Paul, Minn., U.S.A.

United Kingdom

628,467. **Molding Plastic Materials by Extrusion.** S.p.A. Lavorazione Materie Plastiche.

628,468. **Mixing and Compressing Plastic Masses.** S.p.A. Lavorazione Materie Plastiche.

628,650. **Toy Balloons.** J. G. Jakobsen.

629,010. **Forming Catheters and Other Tubular Rubber Articles.** Lee Rubber & Tire Corp.

629,109. **Molding Thermoplastic Resin by Extrusion.** S.p.A. Lavorazione Materie Plastiche.

629,111. **Adhesively Uniting Materials, Especially Metals.** Ciba, Ltd.

629,207. **Coaxial Cable.** United States Rubber Co.

629,228. **Injection Molding of Plastic Substances.** F. C. Goldhard and D. D. Prenn.

629,474. **Producing Slots or Holes in Sheets of Thermoplastic Material.** F. Watson (Kasy Aktiebolag).

630,026. **Resinous Articles.** Imperial Chemical Industries, Ltd., R. M. C. Arnot, and R. Hammond.

630,199. **Fibrous Glass Combined with Synthetic Resinous Material.** A. P. Thurston (Owens-Corning Fiberglas Corp.).

CHEMICAL

United States

2,438,416. **Preparation of Beta (Heterocyclic-Thio) Carboxylic Acid Compounds.** J. E. Jansen and R. A. Mathes, Both of Akron, O., assignors to B. F. Goodrich Co., New York, N. Y.

2,483,468. **Hard Resin Obtained by Heating Simultaneously Phenol, Formaldehyde, and a Normally Liquid Monohydric Alcohol Ester of a Rosin Acid in the Presence of an Acid Condensation Catalyst.** W. D. Jones, West Lafayette, Ind., assignor to Hercules Powder Co., Wilmington, Del.

2,483,514. **Basic Linear Polyamides.** S. J. Allen, London, J. G. N. Drewitt, Spondon, and F. Bryans, Ilford, all in England, assignors to Celanese Corp. of America, a corporation of Del.

2,483,726. **Polyester of a Polyhydric Alcohol.** D. E. Floyd, Minneapolis, Minn., assignor to General Mills, Inc., a corporation of Del.

2,483,753. **Copolymer Made from a Mixture Including 2,5-Dichlorostyrene and Styrene.** T. S. Carswell, Seattle, Wash., and R. F. Hayes, Springfield, Mass., assignors to Monsanto Chemical., St. Louis, Mo.

2,483,778. **Inhibition of Resin Growth from Diolefins.** C. E. Morrell, Westfield, and R. F. Robey, Cranford, both in N. J., assigners to Standard Oil Development Co., a corporation of Del.

2,483,791. **A 1,4-Diene Adduct.** H. M. Teeter, C. R. Scholfield, and J. C. Cowan, all of Peoria, Ill., assignors to The United States of America, as represented by the Secretary of Agriculture.

2,483,854. **Modified Carbamide Resins.** F. H. Snyder, New Rochelle, N. Y., assignor to Snyder Chemical Corp., Bethel, Conn.

2,483,886. **Polymerization Catalyst Including Dispersed Alkali Metal and Carbon Black.** W. W. Crouch, Bartlesville, Okla., assignors to Phillips Petroleum Co., a corporation of Del.

2,483,887. **Polymerization of a Conjugated Diolefin in the Presence of a Catalyst Including Dispersed Alkali Metal and Alkali Metal Mercaptide.** W. W. Crouch, Bartlesville, Okla., assignor to Phillips Petroleum Co., a corporation of Del.

2,483,903. **Reacting 1,3-Butadiene with Furfural so as to Form a Liquid Addition Product.** G. Herbolsheimer, Bartlesville, Okla., assignor to Phillips Petroleum Co., a corporation of Del.

2,483,959. **Improving the Stability of Vinyl Chloride Polymers Formed by Polymerization in Aqueous Suspension in the Presence of a Maleic-Vinyl Acetate Copolymer by Heating an Aqueous Slurry of the Polymer and a Compound from the Group of Salts, Hydroxides, and Oxides of Lead, Barium, and Calcium.** M. Baer, Springfield, Mass., assignor to Monsanto Chemical Co., St. Louis, Mo.

2,483,962. **Heat Polymerizable Compositions of N-Vinyl Pyrrole Compounds Stabilized by Stearyl Alcohol.** C. E. Barnes, Belvidere, N. J., assignor to General Aniline & Film Corp., New York, N. Y.

2,483,963. **Organosiloxanes.** A. J. Barry and E. E. Merrill, assignors to Dow Corning Corp., all of Midland, Mich.

2,483,969. **Acyl Polyalkylene - Polyamine Biguanides.** F. J. Gajewski, Linden, N. J., assignor to General Aniline & Film Corp., New York, N. Y.

2,483,972. **Polysilmethylene.** J. T. Goodwin, Jr., Pittsburgh Pa., assignor to Dow Corning Corp., Midland, Mich.

2,483,984. **Phenyl Thiosalicylate as a Catalytic Plasticizer for Rubber.** S. Searles, Jr., Minneapolis, Minn., assignor to American Cyanamid Co., New York, N. Y.

2,483,986. **Aliphatic Polyene Guanamines.** J. T. Thurston, Cos Cob, Conn., assignor to American Cyanamid Co., New York, N. Y.

2,484,060. **Pressure - Sensitive Adhesive Mass Having a Spongy, Cushion-Like Character and Including Polyisobutylene, Factice, a Tackifying Resin, Plasticizer, and Inert Filler.** H. J. Wing, Milltown, N. J., assignor to Johnson & Johnson, a corporation of N. J.

2,484,215. **Resin Composition from Liquid Monostyrene, the Acid Half Ester Reaction Product of Castor Oil and an Anhydride of an Olefinic Alpha, Beta, Dicarboxylic Acid.** N. C. Foster, Pittsburgh, assignor to Westinghouse Electric Corp., East Pittsburgh, both in Pa.

2,484,216. **Resinous Material Which Is the Reaction Product of Zinc Isopropyl Maleate with Styrene.** N. C. Foster, Pittsburgh, assignor to Westinghouse Electric Corp., East Pittsburgh, both in Pa

2,484,268. **Allyl Thiophenes.** P. D. Caesar, Wenonah, and D. E Badertscher, Woodbury, both in N. J., assignors to Socony-Vacuum Oil Co., Inc., a corporation of N. Y.

2,484,315. **Heat-Curable Resinous Reaction Product of a Methylol Melamine with 2-Nitro-2-Methyl-1-Propanol.** M. J. Scott, Springfield, Mass., assignor to Monsanto Chemical Co., St. Louis Mo

2,484,369. **Liquid Condensation Polymers of Bis(Hydroxyalkyl) Sulfides and Bis(Hydroalkyl) Polysulfides.** S. A Ballard, Orinda, R. C. Morris, Berkeley, and J. L. Van Winkle, San Lorenzo, assignors to Shell Development Co., San Francisco, all in Calif.

2,484,370. **Liquid Sulfoalkylene-Oxalkylene Copolymers.** S. A. Ballard, Orinda, R. C. Morris, Berkeley, and J. L. Van Winkle, San Lorenzo, assignors to Shell Development Co., San Francisco, all in Calif.

2,484,384. **High Molecular Weight Propylene Polymers.** I. E. Levine and L. T. Folsom, both of Berkeley, assignors to California Research Corp., San Francisco, both in Calif.

2,484,415. **Polyvinyl Acetate Phthalate.** C. J. Malm and La M. D. Bearden, assignors to Eastman Kodak Co., all of Rochester, N. Y.

2,484,420. **Quaternizing a Resinous Polyvinylpyridine.** L. M. Minsk and W. O. Kenyon, assignors to Eastman Kodak Co., all of Rochester, N. Y.

2,484,423. **Preparation of Polyvinylamine Salts.** D. D. Reynolds and W. O. Kenyon, assignors to Eastman Kodak Co., all of Rochester, N. Y.

2,484,425. **Increasing the Average Particle Size of Synthetic Rubber Latices by Treatment with an Aqueous Solution of Acetone.** J. S. Rumbold, Woodbridge, Conn., assignor to United States Rubber Co., New York, N. Y.

2,484,430. **Quaternary Salts of Polyvinyl Pyridine and Polyvinyl Quinoline.** R. H. Sprague and L. G. S. Brooker, assignors to Eastman Kodak Co., all of Rochester, N. Y.

2,484,434. **Making Sponge Rubber from Synthetic Rubber Latices and Mixtures of Natural Latex with Such Synthetic Rubber Latices.** E. C. Van Buskirk and P. V. Butsch, both of South Bend, Ind., assignors to United States Rubber Co., New York, N. Y.

2,484,451. **Light-Sensitive Coating Composition Including a Mixture of Bichromated Hydrophilic Colloid, Lead Sulfite, and an Aqueous Colloidal Dispersion of a Water-Insoluble Soft Polymerized Material from the Group of Natural and Synthetic Rubbers, Polyvinylidene Chloride, Polystyrene, Polyvinyl Acetate and Polyacrylates.** W. H. Griggs, assignor to Eastman Kodak Co., both of Rochester, N. Y.

2,484,481. **Neutral Nitromide of a Carboxy Acid as Latent Catalyst for Acid-Curing Aldehyde Reaction Products Capable of Forming Resins under Acidic Conditions.** P. Arthur, Jr., assignor to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

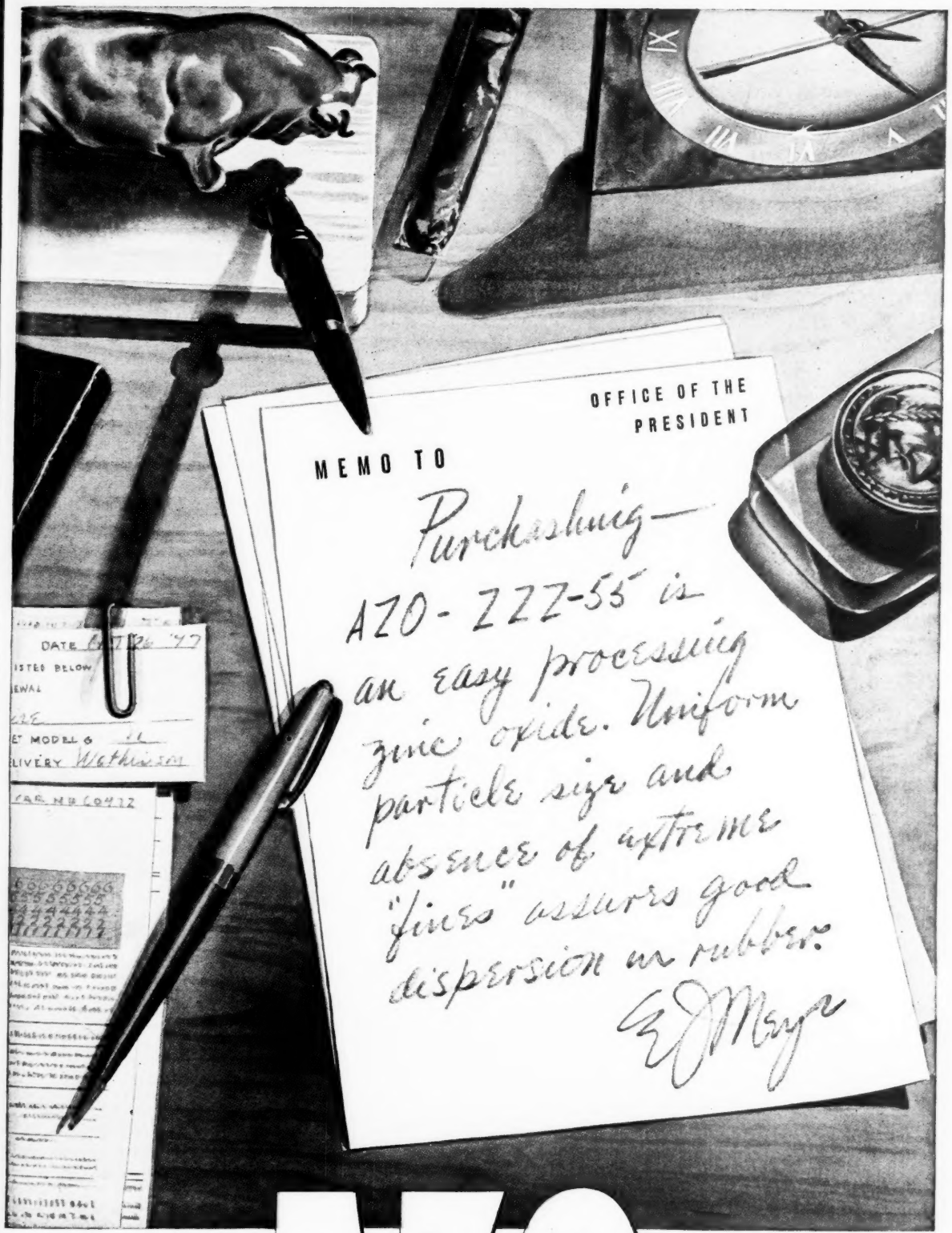
2,484,483. **Composition Including a Dispersion in an Anhydrous Liquid Organic Medium of a Copolymer of Tetrafluorethylene and Another Polymerizable Monoethylenically Unsaturated Compound.** K. L. Berry, Hockessin, Del., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

2,484,501. **Copolymers of Enol Esters of Diketones.** H. J. Hagemeyer, Jr., Kingsport, Tenn., assignor to Eastman Kodak Co., Rochester, N. Y.

2,484,502. **Halogenation of Polyvinyl Alcohol Compounds.** H. J. Hagemeyer, Jr., Kingsport, Tenn., assignor to Eastman Kodak Co., Rochester, N. Y.

2,484,529. **Decreasing the Thermoplasticity and Solubility of Ethylene Polymers by Blending with a Ketone, and Exposing the Blend to Ultra-Violet Light.** M. J. Roedel, assignor to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

2,484,530. **Copolymers of 3,3,3-Trifluoropropene and a Polymerizable Aliphatic Hydrocarbon Containing 2 to 4 Carbon Atoms.** H. E. Schroeder, assignor to E. I. du Pont de



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2,484,595. **Heat-Curable, Elastic Product Containing Methyl- and Phenylpolysiloxane.** M. M. Sprung, Schenectady, N. Y., assignor to General Electric Co., a corporation of N. Y.

2,484,614. **Recovering Cyclized Synthetic Polyisoprene.** J. D. D'Ianni, assignor to Wingfoot Corp., both of Akron, O.

2,484,621. **Addition Product of Carbon Bisulfide and an Amino-Methylene-Naphthol.** A. F. Hardman, assignor to Wingfoot Corp., both of Akron, O.

2,484,633. **Rearrangement and Alcoholysis of Nitrosyl Chloride-Isobutylene Adduct.** A. J. Martin, East Orange, N. J., assignor to Allied Chemical & Dye Corp., New York, N. Y.

2,484,760. **Copolymer of Vinylidene Chloride, Isobutene and a Polymerizable Aliphatic Monoethenic Compound.** H. P. Staudinger, Ewell, and D. Faulkner, Cambridge, both in England, assignors to Distillers Co., Ltd., Edinburgh, Scotland.

2,484,938. **For a Pressure-Sensitive Adhesive Tape a Coating Including the Reaction Product of a Bodied Varnish Oil, a Zinc-Resinate Tackifier Resin, a Sulfur Vulcanizing Agent and a Phenol-Aldehyde Resin.** C. J. Ebel, West St. Paul, and R. G. Drew, assignors to Minnesota Mining & Mfg. Co., both of St. Paul, both in Minn.

2,484,962. **For Shrinkproofing Wool, a Bath Including an Aqueous Emulsion of a Butadiene-Acrylonitrile Copolymer, a Non-Cationic Emulsifying Agent, and a Water-Soluble Neutral Salt of an Alkali Metal as Conditioning Electrolyte.** J. E. Rust, Montclair, N. J., assignor to Montclair Research Corp., a corporation of N. J

2,485,059. **Melamine Condensation Product.** H. W. Mohrman and F. E. Reese, Springfield, Mass., assignors to Monsanto Chemical Co., St. Louis, Mo.

2,485,079-080. **Colloidal Melamine-Urea-Formaldehyde Copolymer Solutions.** H. P. Wohnsiedler, Darien, and W. M. Thomas, Stamford, both in Conn., assignors to American Cyanamid Co., New York, N. Y.

2,485,097. **Natural or Synthetic Rubber Tackified with an Acylated p-Tertiary-Butyl Phenol-Acetaldehyde Resin.** L. H. Howland, Watertown, Conn., and L. B. Tewksbury, Jr., Potsdam, assignors to United States Rubber Co., New York, both in N. Y.

2,485,099. **Production of 1,1,1-Trichloro-3-Bromo-2,3-Dicarbalkoxy Propanes and 1,-1,1-Trichloro-5-Bromo-2 3,4,5-Tetracarbalkoxy Pentanes.** M. S. Kharasch, Chicago, Ill., assignor to United States Rubber Co., New York.

2,485,190. **Lactonization of 2,4-Polyhalogeno-Alkanoic Esters.** E. C. Ladd, Passaic, and H. Sargent, Woodbridge, both in N. J., assignors to United States Rubber Co., New York, N. Y.

2,485,107. **Reacting an Alkaline Polysulfide with a Mixture Containing 1,2,3 Trichlor Propane and Allyl Chloride.** J. C. Patrick, Morrisville, Pa., and H. R. Ferguson, assignors to Thiokol Corp., both of Trenton, N. J.

2,485,136. **Bonding Rubber to a Fibrous Cellulosic Textile Material with the Aid of a Material from the Group of an Aqueous Emulsion of a Primary Rosin Amine, Aqueous Solution of a Primary Rosin Amine Acetate, an Aqueous Solution of a Primary Rosin Amine Hydrochloride, and an Aqueous Solution of a Primary Rosin Amine Hydrobromide.** E. A. Bried, Newport, assignor to Hercules Powder Co., Wilmington, both of Del.

2,485,141. **In the Aqueous Emulsion Polymerization of Vinyl Acetate, the Step of Adding a Ketone.** W. R. Cornthwaite, Wilmington, Del., and H. W. Bryant, Niagara Falls, N. Y., assignors to E. I. du Pont de Nemours & Co., Inc., Wilmington.

2,485,203. **Liquid Urea-Formaldehyde Reaction Product.** H. M. Kvalnes and F. S. Chance, assignors to E. I. du Pont de Nemours & Co., Inc., all of Wilmington, Del.

2,485,239. **Polymer Obtained by Hydrolyzing the Interpolymer of Allylidene Diacetate and Vinyl Acetate.** E. F. Izard, Kenmore, N. Y., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

2,485,248. **Pressure - Sensitive Adhesives, Coated with an Ethylene/Vinyl Acetate Copolymer Containing Octadecandiol Diacetate.** F. K. Watson and P. Arthur, Jr., assignors to E. I. du Pont de Nemours & Co., Inc., all of Wilmington, Del.

2,485,265. **Separation of Triisobutylene Isomers.** L. T. Eby, Roselle, N. J., assignor to Standard Oil Development Co., a corporation of Del.

2,485,271. **Preparation of Bis-(2-Carboxyalkyl) Sulfones.** M. R. Frederick, Wadsworth, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,485,273. **Copolymer of Butadiene-1,3 and Alpha Methyl Para Methyl-Styrene.** P. K. Frolich and E. Arundale, both of Westfield, N. J., assignors to Standard Oil Development Co., a corporation of Del.

2,485,277. **Polymerizing Monomeric Vinylidene Compounds in the Presence of Nitric Oxide to Obtain Clear, Bubble-Free Castings.** H. Gilbert, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,485,294. **Copolymers of Unsaturated Alkyd Resin Modified with Tetrahydroabietyl Alcohol and Styrene.** E. L. Kropa, Old Greenwich, Conn., assignors to American Cyanamid Co., New York, N. Y.

2,485,327. **Impregnating Composition Including the Reaction Product of a Phenol-aldehyde Resin, Petroleum Pitch and a Drying Oil.** H. Snow, Charlotte, N. C., assignor to Southern Friction Materials Co., a corporation of N. C.

2,485,335. **Separation of Rubbery Polymers.** C. W. Tyson, Summit, N. J., assignor to Standard Oil Development Co., a corporation of Del.

2,485,366. **Resolution of Constant Boiling Mixtures of Chlorosilanes.** P. A. Di Giorgio and A. E. Newkirk, both of Schenectady, N. Y., assignors to General Electric Co., a corportion of N. Y.

2,485,454. **Low-Temperature Catalytic Polymerization of Isobutylene and Isoprene, Which Includes Reaction with Nitrous Oxide in Liquid Phase and Subsequent Addition of a Solution of Aluminum Chloride in Methyl Chloride.** J. F. Nelson, Elizabeth, and W. J. Sparks, Cranford, both in N. J., assignors to Standard Oil Development Co., a corporation of Del.

2,485,485. **Removing Anions from Fluid Media with the Aid of an Anion Active Material Which Is Essentially an Aldehyde Condensation Product of an Alkylene Polyamine and Urea.** J. R. Dudley, Cos Cob, Conn., assignor to American Cyanamid Co., New York, N. Y.

2,485,535. **Polymerization of Styrene in Aqueous Emulsion with Ceric Sulfate as Catalyst.** H. F. Park, East Longmeadow, Mass., assignor to Monsanto Chemical Co., St. Louis, Mo.

2,485,592. **Molding Composition Including a Thermoplastic Vinyl Aromatic Resin and a Non-Volatile Non-Drying Oil.** G. A. Griess and E. D. Morris, assignors to Dow Chemical Co., all of Midland, Mich.

2,485,598. **Millable Composition Including a Butadiene Rubber, a Natural or Reclaimed Rubber and a Gel of Ethyl Cellulose in a Blown Product of a Normally Liquid Unsaturated Organic Substance.** M. T. Harvey, South Orange, N. J., assignor to Harvel Research Corp., a corporation of N. J.

2,485,603. **Water-Repellent Coating for a Fabric Including an Organosilicon Thiocyanate.** R. M. Joyce, Jr., assignor to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

2,485,616. **Emulsion Polymerization of Butadiene in the Presence of a Salt of a Middle Fraction of a Dehydrogenated Rosin.** J. H. Long, Marshallton, and D. H. Sheffield, assignors to Hercules Powder Co., both of Wilmington, both in Del.

2,485,625. **Composition Made up of Polyisobutylene, Asphalt, a Hardening Agent Including Polystyrene and a Resinous Condensation Product of a Terpene, a Phenol and Acetone, and a Filler.** R. W. Merley and V. A. Navikas, assignors to Armstrong Cork Co., all of Lancaster, Pa.

2,485,677. **Copolymer of Vinyl Acetate and Diallyl Isobutenylphosphonate.** A. D. Fon Toy, Chicago, Ill., assignor to Victor Chemical Works, a corporation of Ill.

2,485,682. **Polymerization of Conjugated Dienes and Mixtures of Conjugated Dienes with a Compound Including a Vinyl Radical in Aqueous Emulsion in the Presence of a Regulator Including an Amide of Mercaptyl Undecanoic Acids.** K. H. Weber, Washington, D. C., assignor to Armstrong Cork Co., Lancaster, Pa.

2,485,711. **Phenol Aldehyde Resins.** G. L. Doelling, St. Louis, and K. H. Adams, Fenton, assignors to Mississippi Valley Research Laboratories, Inc., St. Louis, both in Mo.

2,485,796. **Production of a Granular Product from an Aqueous Dispersion of a Vinyl Compound to Which Is Added a Completely Hydrolyzed Ethylene/Vinyl Acetate Copolymer; Then Adding Ethylene and Polymerizing.** J. O. White, Arlington, N. J., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

2,485,910. **Plasticizing a Vinyl Resin by Mixing with an Oxidized Ester of an 18-Carbon Unsaturated Fatty Acid and a Monohydric Aliphatic Alcohol Containing not over 8 Carbon Atoms.** L. D. Myers and R. W. Webster, assignors to Emery Industries Inc., all of Cincinnati, O.

2,485,911. **For Use in Coating Compositions a Resin Obtained by Reacting a Petroleum Extract with Sulfur Dioxide.** E. S. Narracott, Sunbury-on-Thames, assignor to Anglo-Iranian Oil Co., Ltd., London, both in England.

2,485,928. **Condensing Monosilanes to Obtain Siloxanes.** P. C. Servais, assignor to Dow Chemical Co., both of Midland, Mich.

2,486,012. **Strippable Coatings from Chlorinated Terphenyl and Cellulose Acetate-Butyrate.** R. Ernst, Los Angeles, Calif.

2,486,024. **Preparation of Polyalkylene Glycols.** G. W. Hearne, El Cerrito, and H. L. Yale, Berkeley, assignors to Shell Development Co., San Francisco, all in Calif.

2,486,162. **Organosiloxanes.** J. F. Hyde, assignor to Corning Glass Works, both of Corning, N. Y.

2,486,182. **Composition Including a Vinyl Chloride-Containing Polymer Heat Stabilized with Propylene Glycol Diricinoleate.** R. E. Lawrence, Springfield, Mass., assignor to Monsanto Chemical Co., St. Louis, Mo.

2,486,183. **Emulsion Polymerization of Butadiene in the Presence of a Salt of a Dehydrogenated Middle Fraction of Rosin.** J. H. Long, Marshallton, and D. H. Sheffield, assignors to Hercules Powder Co., both of Wilmington, both in Del.

2,486,201. **Resin for Low-Pressure Paper-Base Laminates and Wood Surfacing Including a Methylated Melamine Formaldehyde Condensation Product, and a Mixture Containing Styrene and an Unsaturated Alkyd Resin.** D. G. Patterson, Darien, Conn., assignor to American Cyanamid Co., New York, N. Y.

2,486,232. **Wrinkle Coating Composition from a Solution Containing Polyvinyl Butyral Resin and a Glyceride of Conjugated Double-Bonded Oil Fatty Acid.** W. A. Waldie, assignor to New Wrinkle, Inc., both of Dayton, O.

2,486,235. **Craze-Resistant Coating for Plywood Including a Polymerizable Methylated Melamine-Formaldehyde Condensation Product and a Mixture of Styrene and an Unsaturated Alkyd Resin.** W. T. Watt, Stamford, Conn., assignor to American Cyanamid Co., New York, N. Y.

2,486,241. **Production of a Copolymer of an Acrylic Acid Nitrile with an Unsaturated Compound Containing a Single Ethylenic Double-Bond.** H. W. Arnold, assignor to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

2,486,379. **Copolymers of Isopropenyl Acetate and Fumaric or Maleic Ester-Amides.** W. O. Kenyon and C. C. Unruh, assignors to Eastman Kodak Co., all of Rochester, N. Y.

Dominion of Canada

459,937. **Polymerization of Alpha Alkyl Styrenes.** R. G. Heiligmann, Yeadon, assignor to Atlantic Refining Co., Philadelphia, both in Pa., U.S.A.

459,951. **Alkyl Silicon Chlorides.** J. F. Hyde, assignor to Corning Glass Works, both of Corning, N. Y., U.S.A.

459,954. **Rendering Insoluble in Organic Solvents a Preformed Polymer Which Is the Product of a Vinyl Halide Polymerized with a Dialkyl Fumarate by Blending with an Organic Peroxide and Then Exposing the Blend to Actinic Light.** W. L. Alderson, Jr., Wilmington, Del., U.S.A., assignor to Canadian Industries, Ltd., Montreal, P.Q., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington.

459,955. **Rubbery Copolymer of a Fluoro-1, 3-Butadiene and a Vinylethinyl Carbinol.** W. E. Mochel, Wilmington, Del., U.S.A., assignor to Canadian Industries, Ltd., Montreal, P.Q., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington.

459,956. **High Oil- and Freeze-Resistant Synthetic Rubber-Like Material Which Is a Copolymer of 2-Fluoro-1, 3-Butadiene and Acrylonitrile.** W. E. Mochel, Wilmington, Del., U.S.A., assignor to Canadian Industries, Ltd., Montreal, P.Q., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington.

459,957. **Copolymerization Product of a Composition Including Tetrafluoroethylene, a Perchlorofluoroethylene, and a Hydrogen-Containing Halogenated Ethylene.** E. L. Martin, Wilmington, Del., U.S.A., assignor to Canadian Industries, Ltd., Montreal, P.Q., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington.

459,958. **Interpolymer of a Mixed Ester, and a Monomeric Vinylidene Compound.** J. C. Sauer, Wilmington, Del., U.S.A., assignor to Canadian Industries, Ltd., Montreal, P.Q., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington.

459,959. **Light Polarizing Polyvinyl Orthoborate Films.** F. K. Signaigo, Kenmore, N. Y., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., both in the U.S.A.

459,964. **Injecting Chlorine into an Aqueous Suspension of a Granular Porous Solution-Chlorinated Rubber.** H. E. Albert, Akron, O., and R. J. Reid, Fair Lawn, N. J., assignors to Firestone Tire & Rubber Co., Akron, both in the U.S.A.

459,969. **Composition Including a Water-Insoluble Esterification Product of a Rosin Acid and a Polypentaerythritol.** G. R. Anderson, assignor to Hercules Powder Co., both of Wilmington, Del., U.S.A.

459,977. **Adhesive Coating Including a Toluol-Soluble Alkyd Resin Elastomer Re-**

RECIPE

from the Barrett Rubber Research Laboratory

FOR

CUMAR*

RESIN, MH 2½ GRADE,

in Natural Rubber

The comparative data given here illustrate the excellent behavior of CUMAR* Resin, MH 2½ grade, when used as replacement material for 10 parts (weight basis) of natural rubber. It promotes smoother processing properties and lessens danger of scorching. It is an effective and economical extender for natural rubber, and contributes to the retention and/or improvement of significant physical properties. Where better tear resistance is required, it is exceptionally useful CUMAR* Resin, MH 2½ grade, has found wide application in molded and extruded compounds used in the automotive and aviation industries, in footwear, soles and heels, flooring, drug sundries and household goods, mechanicals and insulated wire stocks, cements and adhesives, in white and light-colored items, and in non-staining and non-migrating compounds for uses involving contact with lacquers and enamels.

RECIPE

Smoked Sheets	100.0	90.0
CUMAR* Resin, MH 2½ grade	....	10.0
Calcium Carbonate (Precipitated)	75.0	75.0
Zinc Oxide	5.0	5.0
Stearic Acid	2.0	2.0
"AMINOX"	1.0	1.0
Sulfur	3.0	3.0
Benzothiazyl Disulfide	1.0	1.0
Total	**187.0**	**187.0**
Specific Gravity	1.31	1.33
Rubber Hydrocarbon, % by weight	53.5	48.2
Rubber Hydrocarbon, % by volume	76.0	69.5
Mooney Viscosity, ML, 4 min. @ 212 F.	10	19

Mooney Scorch, ML, 250 F.

Minutes	Viscosity	
1	10	17
5	8	13
10	8	12
15	11	13
20	65	14

Press Cure @ 307 F. (60 lb.) — 10 minutes

		Aged 14 Days @ 70 C.		Aged 14 Days @ 70 C.
	Unaged		Unaged	
Tension and Hardness Data				
Stress, 300%, psi.	600	850	500	750
Stress, 500%, psi.	1600	2200	1500	2050
Tensile, psi.	3250	2600	3300	3100
Elongation, %	680	550	730	630
Permanent Set, %	26	19	34	33
Hardness, Shore A.	50	56	46	52
Tear Resistance, Angle, Pounds per One Inch Thickness	215	200	250	245
Press Cure @ 307 F. (60 lb.) — 15 minutes				
Abrasion Resistance, DuPont	....	480	....	470
Compression Set, 40% Constant Deflection, %	26.8	....	27.3	....
Resilience, Yerzley, %	86.0	92.5	80.5	88.0
Rebound, Goodyear-Healey, %	73.5	81.1	72.3	78.7

*Reg. U. S. Pat. Off.

THE BARRETT DIVISION

ALLIED CHEMICAL & DYE CORPORATION

40 Rector Street, New York 6, N. Y.

action Product of a Polyhydric Oil and Polybasic Acid, Combined with a Tackifier Resin Containing the Abietate Radical. H. C. Brinker, St. Paul, and G. B. Gehrenbeck, Bald Eagle Lake, assignors to Minnesota Mining & Mfg. Co., St. Paul, both in Minn., U.S.A.

460,005. **Partially Unsaturated Microcrystalline Polyesters.** C. J. Frosch, Summit, N. J., assignor to Bell Telephone Laboratories, Inc., assignor to Western Electric Co., Inc., both of New York, N. Y., both in the U.S.A.

460,063. **Shrinkproofing Wool by Heating in an Aqueous Emulsion Containing a Butadiene Polymer and a Non-Cationic Emulsifying Agent in the Presence of a Conditioning Electrolyte.** J. B. Rust, Montclair, N. J., U.S.A.

460,073. **Improved Process for the Production of Acid-Polymerized Paracoumarone Resin.** E. L. Cline, Philadelphia, Pa., assignor to Barrett Co., said Barrett Co. (by its trustees on dissolution) assignor to Allied Chemical & Dye Corp., both of New York, N. Y., both in the U. S. A.

460,074. **Purification of Piperidine.** K. H. Engel, West Englewood, N. J., assignor to Allied Chemical & Dye Corp., New York, N. Y., both in the U.S.A.

460,079. **Hard-Surfaced Flexible Removable Wall or Floor Covering Having a Backing Coat Consisting of a Composition Including Natural, Synthetic, or Reclaimed Rubber, Pigment, and a Water-Soluble Organic Binder.** S. G. Trepp, Dedham, assignor to Bird & Son, Inc., East Walpole, both in Mass., U.S.A.

460,093. **Preparation of Liquid Organosiloxanes.** W. H. Daudt, assignor to Corning Glass Works, both of Corning, N. Y., U.S.A.

460,098. **Polymerizing Ethylene in Aqueous Medium, in the Presence of an Organic Peroxide Catalyst, and in the Absence of a Dispersing Agent, at a Pressure above 300 Atmospheres, and at a Temperature between 50 and 250° C.** M. M. Brubaker, Boothwyn, Pa., U.S.A., assignor to Canadian Industries Ltd., Montreal, P.Q., assignor to E. I. du Pont de Nemours & Co, Inc., Wilmington, Del., U.S.A.

460,100. **Olefin Telomers with Esters.** W. E. Hanford, Short Hills, N. J., and R. M. Joyce, Holly Oak, Del., both in the U.S.A., assignors to Canadian Industries Ltd., Montreal, P.Q., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., U.S.A.

460,124. **Weather-Resistant, Pressure-Sensitive Sheet or Tape Including a Paper Backing Impregnated and Unified with a Water-Insoluble Elastic Alkyd Resin.** W. Kellgren, assignor to Minnesota Mining & Mfg. Co., both of St. Paul, Minn., U.S.A.

460,125. **Vulcanizing a Butadiene-Styrene Rubber in the Absence of Elemental Sulfur by Adding a Di-Xanthic Sulfide.** D. J. Beaver, St. Albans, W. Va., assignor to Mcnsanto Chemical Co., St. Louis, Mo., both in the U.S.A.

United Kingdom

628,454. **Fluorine Containing Hydrocarbon Derivatives.** Imperial Chemical Industries, Ltd., A. J. Rudge, and A. J. Lowe.

628,479. **Interpolymers of Acrylamide and Methacrylamide.** General Aniline & Film Corp.

628,521. **Resinous Compositions.** British Resin Products, Ltd., H. C. Broome, E. M. Evans, and H. Thurston-Hookway.

628,622. **Stabilization of Organic Compounds of High Molecular Weight Containing Inorganic Acid-Forming Elements.** N. V. De Bataafsche Petroleum Mij.

628,686. **Butadiene.** Universal Oil Products Co.

628,731. **Vinyl Compounds.** W. E. Jones and R. L. Barker.

628,818. **Water-Soluble Methylol Melamine Condensation Products.** American Cyanamid Co.

628,821. **Resinous Material.** American Cyanamid Co.

628,875. **Plasticized Elastomer Compositions.** American Cyanamid Co.

628,876. **Reclaiming Plastic Scrap.** Gem Participations, Inc.

628,921. **Cashew Nut-Shell Liquid Furfuraldehyde Condensation Products.** Harvel Corp.

628,944. **Cast Polymerization of Unsaturated Alcohol Esters of Polybasic Acids.** Pittsburgh Plate Glass Co.

629,015. **Polymerizable Materials and Polymers thereof.** Imperial Chemical Industries, Ltd., R. G. Roberts, and R. Hammond.

629,019. **Polymerizable Materials and Polymers thereof.** Imperial Chemical Industries, Ltd., and R. Hammond.

629,035. **Stabilizing Synthetic Polymers.** Dow Chemical Co.

629,046. **Stabilizing Methyl - Substituted Polysiloxanes.** British Thomson-Houston Co., Ltd.

629,093. **Curing Polymerizable Materials.** Libbey-Owens-Ford Glass Co., A. M. Howald, and J. K. Simons.

629,095. **Synthetic Resinous Material.** American Cyanamid Co.

MACHINERY

United States

2,483,569. **High-Frequency Heating Equipment for Heating Dielectric Material.** R. M. Baker, Pittsburgh, assignor to Westinghouse Electric Corp., East Pittsburgh, both in Pa.

2,483,584. **Apparatus to Treat the Surface of Plastic Sheets.** I. L. Lesavoy, Allentown, Pa.

2,483,709. **Vulcanizer for Flexible Elongated Tubular Articles.** J.-F. Paulsen, Paris, France.

2,483,877. **Apparatus for Continuously Polymerizing Unsaturated Organic Material to Solid Form.** S. C. Carney, Bartlesville., Okla., assignor to Phillips Petroleum Co., a corporation of Del.

2,484,419. **Portable, Flat Rack Structure for Supporting a Large Number of Elongated Rubber Articles in Cylindrical Shaped Vulcanizing Receptacle.** S. S. Milner, Mishawaka, Ind., assignor to United States Rubber Co., New York, N. Y.

2,484,656. **Device to Make Containers from Resin Impregnated Laminations.** B. N. Sikka, G. Singh, and L. C. Verman, all of Delhi, India.

2,484,761. **Viscosimeter.** C. R. Stock, Greenwich, Conn., assignor to American Cyanamid Co., New York 1, N. Y.

2,484,777. **Plastic Injection Molding Machine.** A. Ziska, Wauwatosa, Wis., assignor to Ray-o-Vac Co., a corporation of Wis.

2,484,780. **Wrapping Machine.** A. B. Clunan and J. F. Stalter, assignors to Wingfoot Corp., all of Akron, O.

2,485,421. **Mold for Making Rubber Shuttlecocks.** A. M. Timpe, Los Angeles, Calif.

2,485,518. **Wire Insulation Stripper.** L. Vermette, Yonkers, N. Y.

2,485,523. **Apparatus for Continuous Extrusion of Plastic Material.** B. D. Ashbaugh, Mount Gilead, O., assignor to H-P-M Development Corp., a corporation of Del.

2,485,772. **Apparatus to Form Fusible Filament-Forming Polymers into Solid Pieces of Uniform Size and Shape.** W. Pool, Spondon, England, assignor to Celanese Corp. of America, a corporation of Del.

2,485,854. **For Rubber or Like Plastic Materials, a Mixer Designed for Continuous Operation and Including a Tubular Mixing Chamber of Circular Cross-Section.** V. Zona, assignor to Pirelli Soc. per Azioni, both of Milan, Italy.

2,486,346. **Apparatus for Plasticating Particle-Size Thermoplastic Material.** T. Wachs, Cynwyd, Pa., assignor to Radio Corp. of America, a corporation of Del.

UNCLASSIFIED

United States

2,483,908. **Heavy Truck Tire and Wheel Dolly.** G. H. Jackson, Roberts, Idaho.

2,484,532. **Tire and Rim Construction.** C. W. Sinclair, assignor to Kelsey-Hayes Wheel Co., both of Detroit, Mich.

2,484,673. **Adhesive Tape Cutter.** F. M. Becker, Sinking Springs, Pa.

2,484,888. **Brake Valve.** C. Hollerith, Jackson, Mich., assignor, by mesne assigments, to B. F. Goodrich Co., Akron, O.

2,484,948. **Nail Extractor for Pneumatic Tires.** A. Iafrate, Detroit, Mich.

2,485,025. **Deicer for a Windshield Wiper Blade of the Squeegee Type.** G. W. Wattles, Jr., Pittsburgh, Pa.

2,485,095. **Insecticides.** W. D. Harris, Naugatuck, and H. D. Tate, Woodbridge, both in Conn., assignors to United States Rubber Co., New York, N. Y.

2,485,166. **Device to Apply Elastic Gaskets to Disk Members.** A. Repas, Allentown, N. J., assignor to St. Regis Paper Co., New York, N. Y.

2,485,202. **Screw Actuated Tire-Removing Press with Circumferentially Distributed Thrust Elements.** T. Kelly, Port Angeles, Wash.

2,485,330. **Fungicidal Compositions.** W. D. Stewart and J. H. Standen, Yonkers, assignors to B. F. Gooodrich Co., New York, both in N. Y.

2,485,700. **Tool for Forcing Tire Beads into the Drop Center of a Wheel Rim.** M. M. Cook, Visalia, Calif.

2,485,740. **Spare Tire and Wheel Carrier.** M. C. Kazen, assignor to General Motors Corp., both of Detroit, Mich.

TRADE MARKS

United States

511,115. Representation of a circle containing a rectangle containing the words: **"Akron Trusses."** Surgical trusses. Akron Truss Co., Inc., Cuyahoga Falls, O.

511,121. Representation of an oval containing the word: **"Cooper"** and a warrior's helmet. Tires. Cooper Tire & Rubber Co., Findlay, O.

511,127. **Stan-Tone.** Coloring pigment. Harwick Standard Chemical Co., **Akron**, O., assignee of C. J. Harwick, doing business as Standard Chemical Co.

511,131. **Water Sprite*.** Raincoats and hoods. Abraham & Strauss, Inc., Brooklyn, N. Y.

511,132. **Stadium Jrs.** Footwear. Consolidated Footwear Corp., New York, N. Y.

511,133. **Stadium Boot Jrs.** Footwear. Consolidated Footwear Corp., New York, N. Y.

511,155. Representations of three small circles containing the numbers: **"3," "2,"** and **"1".** Footwear. Johnson, Stephens & Shinkle Shoe Co., St. Louis, Mo.

511,158. **Peggy Lee.** Footwear. Consolidated Retail Stores, Inc., St. Louis, Mo.

511,162. **Wingfoot.** Floor coverings. Goodyear Tire & Rubber Co., Akron, O.

511,167. **Non-Skid.** Work gloves. Good Luck Glove Co., Carbondale, Ill.

511,173. **Hoosier.** Footwear. Mishawaka Rubber & Woolen Mfg. Co., Mishawaka, Ind.

511,174. **Hi-Slip.** Footwear. Mishawaka Rubber & Woolen Mfg. Co., Mishawaka, Ind.

511,184. **Redi-Cut.** Brake lining sets. L. J. Miley Co., Chicago, Ill.

511,185. **Campbell's Health Shoe.** Footwear. Powell & Campbell, Inc., New York, N. Y.

511,204. **Kriss Kross.** Anti-skid chains. Peerless Chain Co., Winona, Minn.

511,220. **Johansen.** Footwear. Johansen Bros. Shoe Co., Inc., St. Louis, Mo.

511,225. **"Kontrold Tension."** Surgical hosiery. Surgical Products, Inc., Lowell, Mass.

511,228. **Black Jack.** Work gloves. Indianapolis Glove Co., Indianapolis, Ind.

511,234. Representation of a geometric figure containing the word: **"Cornell."** Tire valves. The Pep Boys, Manny, Moe & Jack, Philadelphia, Pa.

511,277. **Hickey-Freeman.** Raincoats. Hickey-Freeman Co., Rochester, N. Y.

511,287. **Ettco.** Cable. Eastern Tube & Tool Co., Inc., Brooklyn, N. Y.

511,296. **Essex.** Soles and heels. Essex Rubber Co., Trenton, N. J.

511,297. **Mt. Rushmore.** Raincoats. Harvard Clothing Co., Inc., Boston, Mass.

511,344. **Skyline.** Synthetic resin coatings. Monsanto Chemical Co., St. Louis, Mo.

511,356. **Mobo.** Gasket shellac, tire coating, etc. John T. Stanley Co., Inc., New York, N. Y.

511,360. **NCG.** Hose. National Cylinder Gas Co., Chicago, Ill.

511,396. **"Poppy".** Erasers. Joseph Dixon Crucible Co., Jersey City, N. J.

511,413. **Epon.** Synthetic resins. Shell Chemical Corp., San Francisco, Calif.

511,414. **Bar-H.** Braces and garters. Hickok Mfg. Co., Inc., Rochester, N. Y.

511,421. **Ankoseal.** Insulated conductors and cables. Noma Electric Corp., doing business as Ansonia Electrical Division of Noma Electric Corp., New York, N. Y.

511,450. **1126.** Hose. Quaker Rubber Corp., Philadelphia, Pa.

511,451. Representation of an oblong containing the words: **"The Master Barber."** Combs. S. & G. Rubber Co., Inc., New York, N. Y.

511,472. **Rubad.** Adhesive medical plasters. Johnson & Johnson, New Brunswick, N. J.

511,498. **Quik-Labels.** Labels. W. H. Brady Co., Eau Claire, Wis.

511,507. Representation of a map of the State of Massachusetts containing the words: **"Bay State Sports."** Footballs and basketballs. Bay State Sports, Boston, Mass.

511,531. **Stout Arch.** Footwear. Lane Bryant, Inc., New York, N. Y.

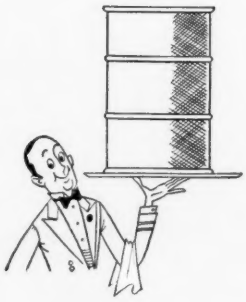
511,534. **ATF.** Equipment for use in the graphic arts including rubber plate machines. American Type Founders Sales Corp., Elizabeth, N. J.

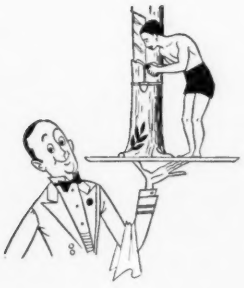
511,581. **Resion.** Synthetic resins. Monsanto Chemical Co., St. Louis, Mo.

511,583. **Permacel.** Tape. Industrial Tape Corp., New Brunswick, N. J.

511,584. Representation of a panther on a roll of tape and the word: **"Panther."** Tapes. Okonite Co., Passaic, N. J.

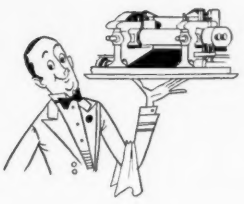
511,617. **Lee of Conshohocken.** Rubber sponges. Lee Rubber & Tire Corp., Conshohocken, Pa.



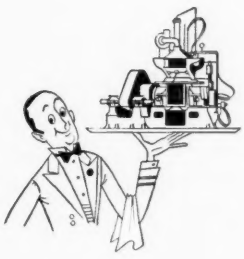


at the plantation?†

where would you like your plasticizer added?



in the open mill?



in the banbury?

PEPTON* 22 plasticizer

Can be added at any of these points.

Cuts breakdown time at least 50%... reduces power consumption... improves processing qualities... has no effect on the physical or aging characteristics of rubber

†No. 1 Ribbed Smoked Sheets-Plus are produced by adding PEPTON 22 to the latex prior to coagulation.

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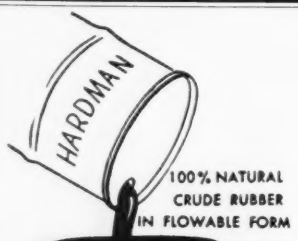

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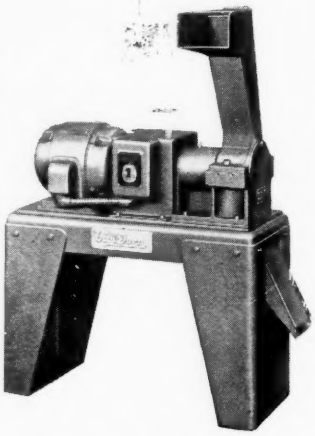


Van Dorn Model G-100 Grinder

THE new Model G-100 grinder has been announced by Van Dorn Iron Works Co., Cleveland 4, O., as an addition to its line of plastics machinery. Designed primarily for grinding rigid thermoplastic scrap, this machine can also be used for other rigid materials. The unit is of welded all-steel construction, with a one-piece alloy steel motor mounted on ball bearings and coupled directly to the motor. The knives are of alloy steel; three revolve while the other two are stationary and adjustable. The chute and hopper openings are hinged to facilitate cleaning. The hopper can be easily taken off by removal of three bolts; while the hinged-end plate permits quick removal of the screen. The grinder has a capacity up to 50 pounds an hour, depending on the type and the size of the material being granulated. The unit is 36 inches long, 20 inches wide, 48 inches high, and weighs approximately 400 pounds.

Rubber Cushion Cutter

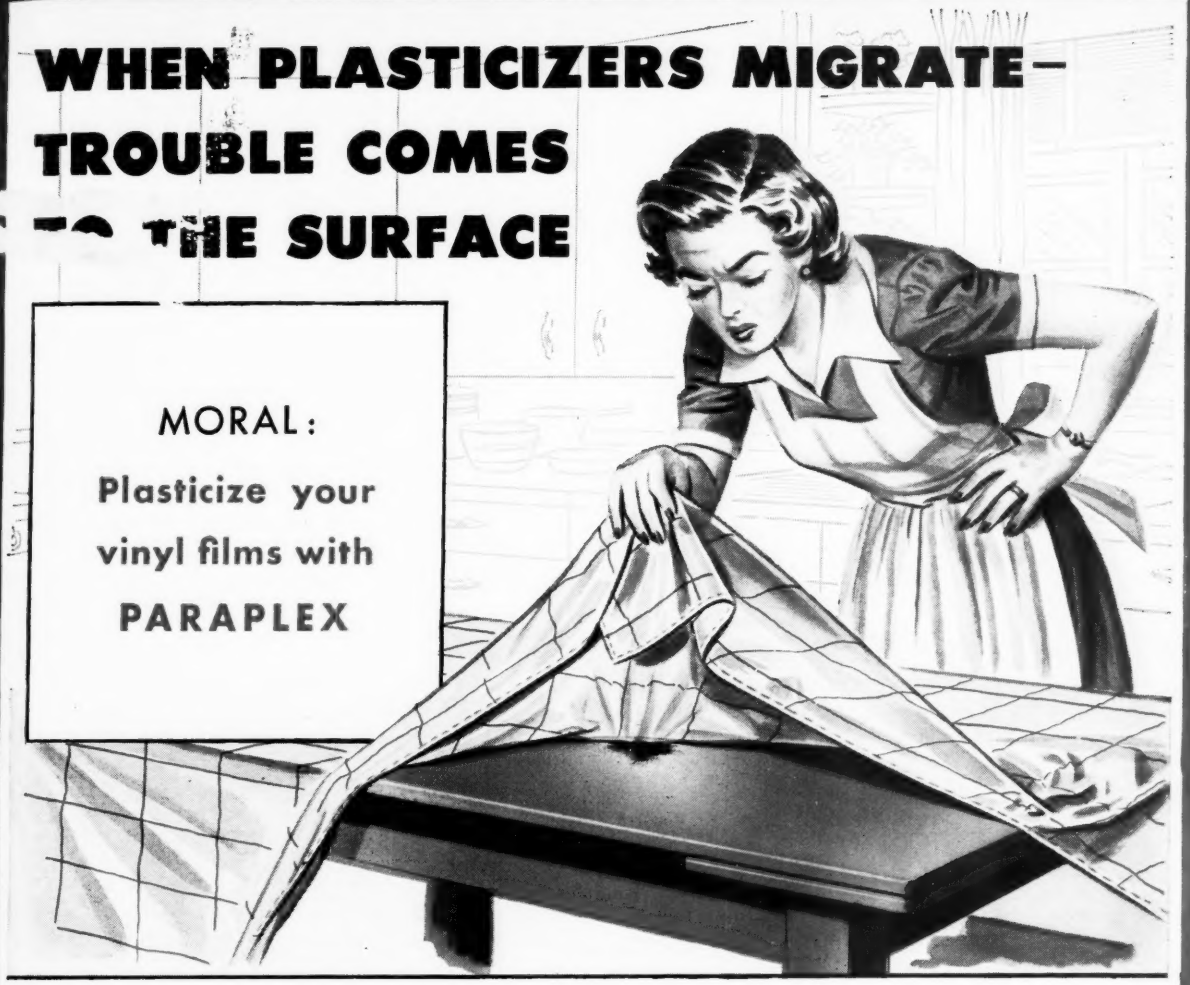
THE Campbell foam rubber cushion cutter, a machine with interchangeable heads which permits both cutting and splitting on the same machine, has been designed by Campbell Machinery Development Co. and is being built by The Falls Engineering & Machine Co., Cuyahoga Falls, O. By using the cutting head the operator can cut contours and angles in stock as thick as eight inches. Removing the cutting head and inserting the splitting head permit splitting stock as thin as 1/16-inch. The combination feature, believed revolutionary in the field, makes one machine do the work of two, and the transition from cutting to splitting requires only a few minutes to accomplish.

Besides speeding the production of rubber cushioning and seating products, the machine, it is further claimed, reduces fabricating costs by permitting the purchase of stock in standard

PHILBLACK O PHILBLACK A PHILBLACK O PHILBLACK A PHILBLACK O

Philogeants?
SEE PAGE 256
PHILBLACK O PHILBLACK A PHILBLACK O PHILBLACK A PHILBLACK O

WHEN PLASTICIZERS MIGRATE— TROUBLE COMES TO THE SURFACE



MORAL:
Plasticize your vinyl films with
PARAPLEX

You can't keep fugitive plasticizers under cover. They migrate from one surface to another . . . volatilize and leave vinyl films stiff and brittle . . . rub off on clothing . . . *ruin furniture by sticking to varnish and lacquer, by actually removing the finish!*

The PARAPLEX plasticizers are your best insurance against migration. Once a part of vinyl compounds, they stay there—despite constant rubbing, high heat, and prolonged contact with varnished or lacquered surfaces and baked finishes. They are your guarantee of permanent plasticization—of permanent customer satisfaction.

PARAPLEX G-50 is the polymeric plasticizer at a monomeric price. Its resistance to migration, volatilization, and extraction brings long life to free and supported film, to molded and extruded vinyl compounds. It processes readily and has unexcelled pigment wetting and grinding properties.

And PARAPLEX G-25 is the ultimate in plasticizing permanence. A high molecular weight polymer, it does not spew or migrate even at high temperatures. Its volatility is essentially zero; its resistance to heat and ultraviolet light, outstanding. Its extractability by oil, water, and cleaning fluids is extremely low. Long after monomeric plasticizers have fled from vinyl compounds, leaving them cracked, crazed, and embrittled, compounds plasticized with PARAPLEX G-25 *retain their initial flexibility.*

PARAPLEX *is a trade-mark, Reg. U. S. Pat. Off. and in principal foreign countries.*

Write to Department **IR-2** for technical literature describing PARAPLEX G-25 and PARAPLEX G-50.

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THE RESINOUS PRODUCTS DIVISION

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The Resinous Products Division was formerly The Resinous Products & Chemical Company

LOST! $5,000,000 to $10,000,000

"The estimated annual loss to the rubber industry for direct scorched (prematurely vulcanized) material waste . . . probably one-third to one-half of the industry's annual bill for accelerators . . . and equivalent to 3% to 5% of sales.

"The weight of evidence . . . seems to favor the use of the Mooney Plastometer (Viscometer) for all around balance in *speed, simplicity, temperature control, good reproducibility, and sensitiveness to incipient scorching.*"*

Mooney Shearing Disc Viscometer
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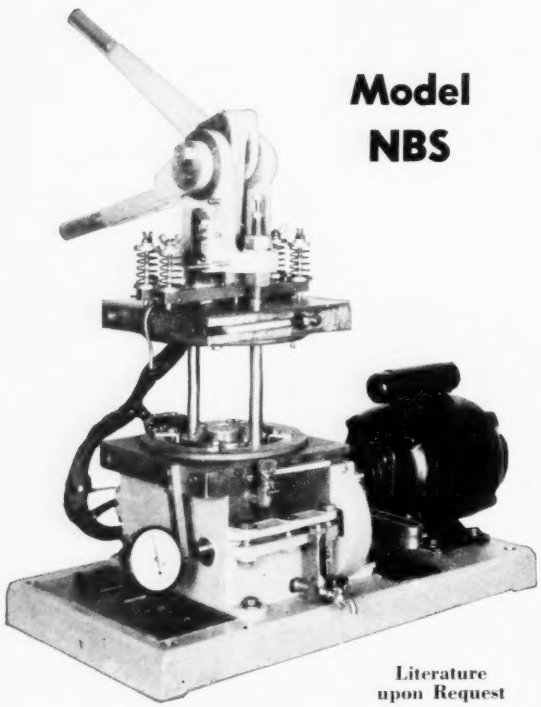

Model NBS

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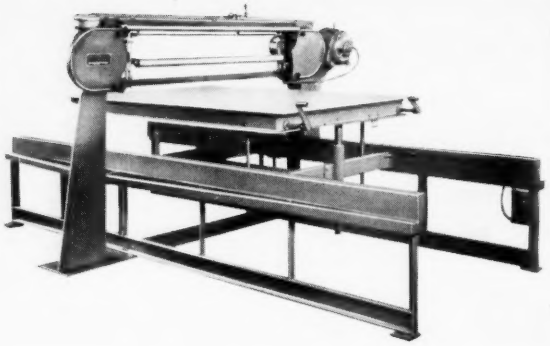
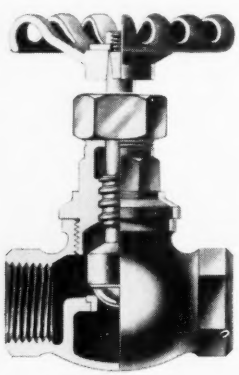
*Excerpts from article published in INDIA RUBBER WORLD
Reprints of entire article are available on request to us.



Foam Rubber Cushion Cutting Machine

thicknesses. The cushion cutter will make both concave and convex cuts the full width of the material which is fed under the saw blade on a table top, adjustable both vertically and horizontally. The table top also moves back and forth on a roller carriage. Falls is building the machines in three table sizes: 45 by 65 inches; 45 by 84 inches; and 64 by 96 inches.



Bull-Dog Ball Valve

Improved Valve

THE Bull-Dog ball valve, embodying principles marking a definite departure from conventional practice, has been announced by Carpenter Mfg. Corp., Cleveland 2, O. A precision-ground stainless steel ball is used to replace the old-fashioned disks, poppets, etc., normally used in valves and provides a lifetime seating member with no harmful effect on the seat.

The ball is spun into its retainer with a slight clearance which permits the ball to spin when the valve is opened or closed, thus allowing the ball to find a new seat each time. Care is exercised to hold the ball clearance accurately, preventing chatter when opening, closing, or throttling the valve. The valve is supplied with O-ring seals for normal service and with conventional steam packing for use in steam or other high-temperature service. Made of brass, the valves are at present available in ½- and ¼-inch sizes for 300 pounds' water, oil, or gas pressure.

New Rem Board Cutting Block

Cutting Block

INCREASED thickness and a newly developed plastic compound make for longer life in the Rem Board cutting block now being marketed by Remington Products Co., Akron, O. One inch thick, the improved block provides a tough, resilient surface for mallet cutting, hand cutting, and die cutting on clicking machines. Elasticity of the material minimizes the need of planing and dressing, and field tests conducted by the manufacturer are said to have demonstrated 50% longer life than conventional boards. Offered on a 30-day trial basis, the board is available in standard and special sizes required by manufacturers of rubber, leather, fiber, plastic, and light metal parts.

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Merriment

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Prosperity

throughout the

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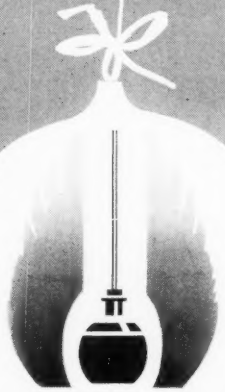

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EUROPE

GREAT BRITAIN

Rubber Nationalization Proposal Rejected

At the Trades Union Congress at Bridlington on September 8, the general secretary of the United Rubber Workers of Great Britain, H. Eastwood, speaking for that organization's 3,000 members, proposed the nationalization of the rubber industry. He pointed out that the General Council was committed to support nationalization of the chemical industry, which was linked with rubber. These two vital industries were controlled by Imperial Chemical Industries, Ltd., and Dunlop, he declared, quoting details, especially of the profits of Dunlop, in support of his statement and concluded with the warning that the country was in danger in peace and in war as long as the monopoly was left in the hands of the concerns named.

The general council, however, rejected Mr. Eastman's proposal. It was made clear that since the question of the nationalization of the chemical industry had yet to be settled, the proposal for nationalization of rubber was putting the cart before the horse.

Latex for Small Manufactories?

"Latex—A Cottage Industry?"[1] draws attention to the possibilities opened up by the expiration of many of the fundamental latex patents held by International Latex Processes, Ltd. Now "it only requires certain elementary plant and a supply of latex and compounding materials to start in business as a rubber manufacturer," the British paper remarks and points to the T. L. latex dipping plant specially designed and built (for the small manufacturer of latex goods) by E. H. Turner of Bournemouth with the collaboraton of J. R. Leeman.

The T. L. plant includes dipping machines, tanks, formers, former trays, vulcanizing chambers, ovens, and accessory equipment. Mr. Turner is quoted as claiming that he can supply plant for a small remunerative business for as little as £300. Recognizing that possession of plant is not enough and that knowledge of the various processes of latex manufacture is also necessary, Mr. Turner has asked "one of the greatest British authorities on latex manufacture" to prepare minute instructions on the operation of the plants and their further possibilities.

The new National College of Rubber Technology has ordered T. L. plant for its laboratories, which includes a dipping unit on which 50 gross of balloons can be produced daily by one girl operator.

[1] *Rubber Age (London)*, Sept., 1949, p. 270.

New Philblack Plant

At the annual meeting of Philblack, Ltd., July 27, in London, the progress being made on the construction of the Philblack plant for producing carbon black in England was reviewed. The company leased about 17 acres at Chittening near Avonmouth Docks, and work began May 6, 1949. Provided no unforeseen setbacks occur and plant and equipment arrive as contracted for, the plant is expected to go into production in the latter half of 1950.

The plant is designed to produce 50,000,000 pounds of carbon black per annum, including 20,000,000 pounds of Philblack A and 30,000,000 pounds of Philblack O. By agreement with the Phillips company in America, the substantial imports of Philblack from them will cease when the English plant is in production.

Program of IRI Activities

Lectures at sectional meetings of the Institution of the Rubber Industry during 1949-50 include:

LONDON: *October* 4, "Evaluation of the Wearing Properties of Pneumatic Tire Tread Compounds," by E. R. Thornley; *November* 1, "Rubber in the Manufacture of Cables," H. C. Harrison; *November 22*, "Bonding," W. J. S. Naunton, and J. M. Buist; *December* 13, "Latex Molding by Plaster Casting," S. C. Stokes, and "Latex Molding by the Slush Process," C. F. Flint; *January*

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EXCELLENT FOR *Light Colored* PRODUCTS!

PANAFLEX BN-1 is an economical, light-colored plasticizer for synthetic rubber — especially butadiene-acrylonitrile type.

This new hydrocarbon plasticizer *completely* replaces dibutyl phthalate in nitrile rubbers — produces soft vulcanizates having high tensile, excellent elongation, and very low modulus. **PANAFLEX BN-1** plasticized stocks possess good ageing properties, superior electrical characteristics, and show good gasoline and oil resistance.

SPECIFY GRAVITY	0.9440
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REFRACTIVE INDEX	1.553
DISTILLATION, °F	560-730
ODOR	Excellent
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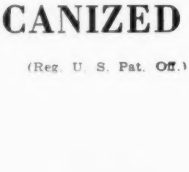

Our products are engineered to fill every need in natural and synthetic rubber compounding wherever the use of vulcanized oil is indicated.

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10, "Safety in the Rubber Industry," Joint Industrial Council, A.R.I.C.; *January* 24, "Wax Blooming and Exposure Cracking," R. C. W. Moakes and L. L. Best; *February* 7, "Oxidation of Rubber," L. Bateman; *March* 17, "Dynamic Properties of Rubber," a symposium; *May* 5, Foundation Lecture.

MANCHESTER: *September* 26, "Power Factor and Vulcanization," J. R. S. Waring; *December* 1, "Continuous Vulcanization with Reference to Flooring, Belting, Etc.," J. C. Bierer; *December* 12, "Sulfur Chloride Reactions in Relation to the Rubber Industry," C. E. Webb; *January* 23, "Some Aspects of the Stability of Compounded Latex," K. W. Hayes; *February* 10, "Polythene," M. Jones (at joint meeting with Plastics Institute); *February* 27, "Ozone Cracking and Wax Blooming," L. L. Best and R. C. W. Moakes; *March* 27, "Polytetrafluorethylene," H. Whitcut.

Industry Notes

Anglo-American Oil Co., Ltd., has announced that the oil-resistant nitrile synthetic rubber hitherto marketed under the name Perbunan is to be known in future as Paracril.

United Carbon Black, Ltd., which recently erected and installed plant at its works at Swansea, South Wales, to manufacture carbon black from British materials, reports the first bulk production of this material.

Techne (Cambridge), Ltd., is marketing a new viscometer devised by N. A. de Bruyne, managing director of Aero Research, Ltd., for rapid measurement of the viscosity of thick sticky fluids.

Imperial Chemical Industries, Ltd., now makes its Alkathene (polythene) film available in a new form. Already produced in continuous rolls up to 46 inches wide, Alkathene is now also obtainable as lay-flat, thin-walled seamless tubing which can be made into bags by cutting into suitable lengths and heat-sealing. Lay-flat tubing is at present made 0.0025-inch thick and three to five inches wide, equivalent to tube diameters of 1.91 to 3.17 inches, but the range is to be extended to include widths from two to 24 inches and thicknesses from 0.0015- to 0.005-inch. Alkathene film is said to be particularly suitable for packaging frozen foods; it also seems promising for packing carbon black. Newest tests aim to determine the suitability of the materials as cover for baled rubber for shipment from the Far East. It is suggested that one advantage of this application would be that the polythene would disintegrate and disappear in the rubber mix.

After about 13 years with P. B. Cow & Co., Ltd., London, and its associated companies Gilbert MacIntosh recently resigned as the firm's chief buyer.

Among the new developments in the rubber and plastics industries to be seen at the Engineering & Marine Exhibition at Olympia, London, from August 25 to September 10, were applications of sprayed polythene, shellac and "Thiokol" (Schori Metallizing Processes Ltd.); "Paracril" synthetic rubber products (Anglo-American Oil Co.); Silicone rubber products (Albright & Wilson Ltd.); rubber carpet matting as anti-vibration mounting for very heavy machinery installations (Dunlop Special Products, Ltd.).

Tyresoles, Ltd., has developed a new method of improving anti-skid properties of tires by the use of metal in the form of corrugated helical wire. In producing the new "Wyresoles," as they are called, the wire is laid around the tread ribs of the curing ring before vulcanizing and become embedded in the tread rubber during vulcanization. When the tire is first fitted to a car, the wire is a continuous coil, but after running a few hundred miles, the top of each loop is worn through leaving a series of U-shaped staples. Since the wire is not bonded to the rubber, but held in place by the corrugations, it is free to move within the rubber and to project when the tread is under compression.

If the plan of International Bulk Liquids Storage & Transport, Ltd., succeed, Hull will become the second English center for bulk import of rubber latex. Hitherto Liverpool, on the West Coast of England and almost exactly opposite Hull on the East Coast, has been the only English port receiving bulk shipments of latex. A first cargo of 50,000 gallons of latex arrived at Hull in September, and it is hoped that regular monthly shipments will follow.

At a meeting of the National Union of Manufacturers, held in London recently to discuss the effects of the devaluation of sterling on trade, group action by medium and small firms was recommended in exporting to the United States.

Whatever other effect the devaluation of sterling may have, it should at least put a stop to the practice in certain non-sterling countries of using sterling to buy excess rubber and rerouting surplus rubber to America, frequently at prices below the market rate. As a result Britain lost needed dollars; while in addition such manipulations tended to depress the price level.

GERMANY

Report of the Dechema Conference

The Dechema, German Society for Chemical Apparatus, held a conference in Frankfurt a.M., July 24 to 29, which aimed at furthering cooperation on a broader basis between chemists and engineers. Many papers were read dealing with laboratory technique, apparatus, materials, and processes, including:

"Some New Measuring and Testing Devices for the Chemical Industry," by R. Berthold; "Recent Developments in the Field of Viscosimetry," H. Umstatter; "New Devices for pH and Photo-Electric Measurements," B. Lange; "Dielectric Constant Measurements and Their Importance in Laboratory and Factory," by K. Slevogt. (These measurements permit control of purity of substances, determination of proportions of components in solutions, mixes, etc., and observation of distillation, aging and polymerization processes. A device has been developed by the Scientific-Technological Works in Wessobrunn, Obb., by which measurements on fluids, powders, and solids can be made with a high degree of accuracy.)

"Friction-Mixing Pump for Plastic and Viscous Masses," by S. Kiesskalt. (This apparatus serves for homogenizing materials and is useful for making dispersions of synthetics, among other purposes.)

"Increased Production by the Use of High-Speed Mixing Machines," by E. K. Todtenhaupt. (Contrary to the usual opinion that more viscous materials can only be thoroughly worked with slowly revolving, large-dimensioned devices, the author finds that rapid screw mixers can be used effectively on materials with a viscosity up to about 3,500 centipoises.)

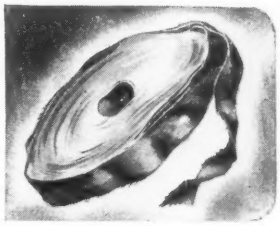
"Synthetic Resins for Corrosion-Resistant Structures," by W. Hamerkamp; "A New Process for Covering and Lining with Polyvinylchloride," R. Hagen. (This is the Kautex-Vietum process invented by H. Hagen, by which bent pipes and profiles of any cross-section, pins, cords, and chains can be covered or lined with synthetic resin, especially polyvinyl chloride. The Kautex Werke of Hangelar uber Siegling supplies semi-finished tubes or pipes of the resin with which the purchaser can treat articles himself. When the outer surface of an object is to be protected, polyvinyl chloride tubing or pipe substantially wider than the object is used so that the protective cover can easily be drawn over articles even when they have very sharply defined curves. The covered article is placed in a drying cabinet or exposed to hot air blowing, whereby the cover shrinks to such an extent that it adheres tightly to the outlines of the object. For lining profiles or pipes, tubing is supplied that is drawn through the hollow body. In this case heating causes the lining to expand to fit and cling to the interior surface of the object. Other shapes for covering or lining different articles are also supplied and not only polyvinyl chloride, but all other thermoplastic synthetic materials can be used in Hagen's process.)

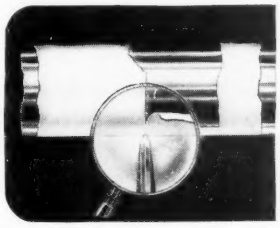
"Vinidur and Opponol (P.V.C. and Polyisobutylene) in the Construction of Apparatus and for Protecting Structures," W. Krannich; "Recent Developments in Solvent Resistant Packings," G. Diefenbach; "Modern Problems of Surface Protection in the Chemical Industry," M. Schulte; "Lacquers for Protecting Surfaces in the Chemical Industry," O. Merz; and "Recent Developments in Acid-Resistant Construction," F. Heinrich.

How *Camachines* have increased the sales appeal of friction tape

THE PROBLEM ▶

At one time rolls of friction tape were made by pressing a knife through long rolls of the material and the paper core. Rolls were misshapen. The edges of the tape were frayed, tangled, stuck together—a constant annoyance to the user.





◀ THE SOLUTION

The Camachine score cut method was adapted to a slitter-winder specially designed for fast production of top quality rolls of friction tape. Note how the web is cleanly parted by pressure of the slitter wheels against the smooth steel backing roller.

THE RESULT ▶

Clean-cut rolls that separate easily. Tape with clean, frayless edges that will not ravel. Camachine 26-4D handles web as wide as 49"; slits strip as narrow as ½" across the full width of the web; removes and rewinds the liner from the original roll.

This major improvement in friction tape was achieved because a production-minded idea man called in a Camachine expert to help work out a problem. Many other cost-cutting Camachines for the rubber industries have been developed in the same way. If you're looking for increased roll production, improved roll quality and lower costs, why not ask to see what we can do for you?

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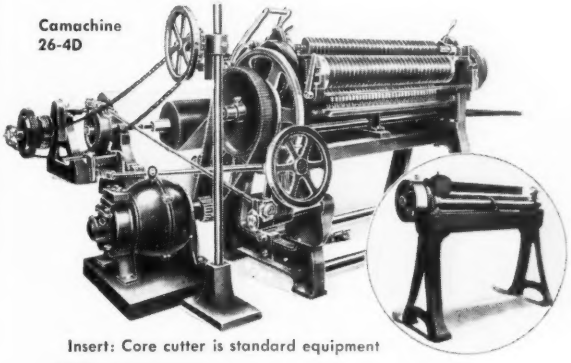
Camachine 26-4D



Insert: Core cutter is standard equipment

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The Diasolysis Process

Details of the method of diasolysis, discovered by H. Brintzinger and H. Beier a few years before the war, indicate that in principle it resembles dialyses, but the basic difference between the two is that diasolysis is applicable to only certain, organophilic compounds soluble in the material of the membranes itself without the aid of pores, and further that the diasolysis coefficient is independent of molecular weight. The membrane material selected is cured or uncured rubber, or a synthetic plastic, and substances not soluble in the material of the membrane, especially salts, acids, and inorganic bases, as well as all colloids, are incapable of diasolysis and have a diasolysis coefficient of zero. Diasolysable materials can therefore readily be separated from them.

Experience thus far indicates that the new process can be successfully used for separating diasolysable from non-diasolysable substances; for isolating organic substances from plants or from animal organs (hormones, for instance), separating isomers, separating neutral, basic, and acid organophilic substances. The process can be carried out as extraction diasolysis in the Soxhlet apparatus or by means of a diasolysis column or the super diasolyser. A diasolysis column put out by Dr. Dinkelacker G.m.b.H., Heidenheim, is described.

[1] *Chem.-Ing.-Technik*, 21, 13/14, 273 (1949).

Progress at Continental Gummiwerke

Continental Gummi-Werke A.G., Hannover, reports that despite repeated price cuts by the firm, earnings have so far been satisfactory. However the disturbances and difficulties in the general economic processes here have also affected the concern and sales of certain types of mechanical goods and heavy-duty tires have declined. The much criticized importation of considerable quantities of tires has had especially unpleasant results. Continental is nevertheless attempting to maintain production and thus postpone lay-offs as far as possible.

Export trade is still restricted to certain special lines of goods for a comparatively small number of foreign countries.

The directors have approved extensive plans for continuing reconstruction, erecting new buildings, and acquiring new equipment to modernize the factories. The firm is also interested in a housing project for its employes and so far has secured new living quarters for about 400 families.

LUXEMBOURG

The Goodyear Tire & Rubber Co. Akron, O., U.S.A., will erect a large tire factory in Colmarberg, Luxembourg, and for this purpose has formed a company registered in Luxembourg and capitalized at 45,000,000 francs, in 45,000 shares of 1.000 francs each; all but six of these shares are said to be held by the present company in America. Construction of the factory is expected to be completed in about one year, and when fully equipped, it will employ about 1,000 persons.

SWITZERLAND

Heavy postwar demand, particularly of tires, technical rubber goods, and insulated cables, taxed local output to the utmost in 1946, 1947, and 1948, and domestic production had to be supplemented by relatively heavy imports. In the first half of 1949, however, a retrogression occured, and home production, imports, and also exports shrunk. The situation seems to have become particularly adverse for makers of cycle tires, several of whom are reported to have changed over to the manufacture of other goods.

Imports of rubber goods in 1947 totaled 16,164 metric tons, and in 1948, 16,031 tons; while exports rose from 2,432 tons in 1947 to 2,664 tons in 1948. In the first half of 1949, however, imports declined to 5,642 metric tons, against 10,355 tons in the same period of 1948. Exports dropped from 1,317 in the 1948 period to 733 tons in the '49 half.

Imports of all kinds of synthetic resins in 1948 amounted to 2,767 metric tons, with a value of 7,717,726 francs.[1]

[1] One Swiss franc equals about 23c U. S. currency.

Editor's Book Table

BOOK REVIEWS

"Proceedings of the Second Rubber Technology Conference, 1948." Edited by T. R. Dawson with the assistance of C. M. Blow and G. Gee. W. Heffer & Sons Ltd., Cambridge, England, for the Institution of the Rubber Industry, 12 Whitehall, London, S.W. 1, England. 556 pages. Cloth, 7 by 9½ inches. Price £3/3s.

The complete text of the 43 papers presented and the discussions which followed at the Second Rubber Technology Conference sponsored by the Institution of the Rubber Industry in London, England, June 23-25, 1948, have now become available in this book. The papers cover recent developments in the chemistry and physics of natural and synthetic rubbers and the methods of testing and analysis of both raw and finished products. As indicated in the foreword, these papers with their resultant discussions form a very valuable contribution to our technical knowledge and are a worthy companion to the book which followed the first conference in 1938.

Also included are the agenda and discussion held by Conference members on June 24 as preparation for the meeting of Technical Committee 45 of the International Organization for Standardization held in London on June 28 and 29. Test methods for the determination of tensile strength, hardness, abrasion resistance, and tear strength were compared.

Also appearing in the book are some details of the several social events held in connection with the Conference.

"Handbook of Chemistry." Seventh Edition. Compiled and edited by Norbert A. Lange, assisted by Gordon M. Forker. Handbook Publishers, Inc., Sandusky, O. Fabrikoid, 5½ by 8 inches. Price $7.

The recognized value of this standard reference work is such as to require no further elaboration. In order to avoid ungainly bulk and size, the present edition shows a reduction in number of pages from the preceding issue despite the inclusion of many new tables. This reduction has been accomplished by the elimination of the appendix on mathematics, now available as a separate book, and its replacement by a condensed mathematical section giving logarithmic and trigonometric functions.

To modernize the handbook some 24 tables have been extended or completely rewritten, including the table on synthetic rubbers and plastics which now gives formulaes and extensive data on physical and chemical properties. New tables appearing for the first time include: abundance of the elements; glyceride content of drying oils; properties of hormones; ASTM classification of coals by rank; formulae for calculating mineral-free BTU and fixed carbon; density of fuming sulfuric acid solutions; dielectric constants; diphole moments; mass of water in saturated air; partial pressures of aqueous ammonia solutions; Kopp's rule for calculating specific heat; logarithms of equilibrium constants; viscosity of aqueous sucrose solutions; and viscosity of aqueous ethyl alcohol solutions.

"Engineering Laminates." Edited by Albert G. H. Dietz. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. Cloth, 6 by 9¼ inches, 804 pages. Price, $10.

For anyone concerned with the design, manufacture, and use of structural materials, this volume presents comprehensive and organized data on engineering properties of laminates. The text covers composites of essentially all one class of material and composites of several widely different materials, but excludes decorative laminates and laminates in which the surface material is essentially only a protective coating, such as plated and galvanized materials. Each of the 22 chapters was written by authorities, and all the data are effectively gathered into a unified presentation. Many tables, graphs, and illustrations are included, and an adequate index is appended.

Individual chapters cover: strength of laminates and sandwich structural elements; adhesives; glued-laminated wood; plywood; composite laminated-wood-concrete construction; plastics-based laminates; thermostat metals; aluminum-clad products; hot-dipped aluminum-coated steel; copper and copper-alloy clads; nickel-clad, Monel-clad, and Inconel-clad steel; stainless-clad steel; cast laminated metallic materials; hardness and wear resistance — hard surfacing by fusion welding; sprayed metal; glass-lined steel equipment; composite-glass structures; sandwich-type building boards having insulation board cores; plastic-surfaced plywoods and their properties; structural

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sandwich construction: rubber laminates; and molding laminates and sandwich materials. The rubber laminates chapter, by Walter E. Burton, is based on the books, "Engineering with Rubber" and "Rubber as an Engineering Material," and includes data on rubber properties and use in belting, lined and coated equipment, hose, and insulators.

NEW PUBLICATIONS

"Aromex (HAF) Black." J. M. Huber Corp., 342 Madison Ave., New York 17, N. Y. 4 pages. This bulletin presents data on Aromex, a new HAF black intended especially for the reinforcement of low temperature GR-S. Physical properties of Aromex appear, and tables compare the properties of Aromex and another black in a low temperature formulation, and Aromex and a 50-50 blend of Aromex and Wyex (EPC) in a natural rubber formulation.

"Pros and Cons of the I. T. O. Proceedings of the Rubber Manufacturers Association Forum on the Havana Charter for an International Trade Organization." Hotel Roosevelt, New York, N. Y., June 28, 1949. The Rubber Manufacturers Association, Inc., 444 Madison Ave., New York 22, N. Y. 131 pages. Price $1. The verbatim record of the Forum on the I. T. O., including the discussions which followed the various speakers' presentations and the questions from the audience and their answers, are now available to interested persons. All those present at the Forum have already received complimentary copies of this booklet.

"Paraplex G-60 (Formerly Experimental Paraplex AP-63)." Resinous Products Division, Rohm & Haas Co., Washington Square, Philadelphia 5, Pa. 8 pages. Data are given on Paraplex G-60, a new polymeric material of high plasticizing efficiency, low viscosity, light color, and good low-temperature properties. Information appears on the material's properties, solubility, and applications, including use with chlorinated rubber, vinyl and cellulose resins, and other materials.

"Nylon Cord Truck Tires." E. I. du Pont de Nemours & Co., Inc., Wilmington 98, Del. 8 pages. This illustrated bulletin describes the advantages of nylon cord in tires; presents brief accounts of several outstanding performances of nylon cord tires in truck use, and the history of nylon tires; and gives the answers to typical questions about such tires.

"3 Ways of Gaging Your Product Continuously." Pratt & Whitney, Division Niles-Bement-Pond Co., West Hartford, Conn. 26 pages. This folder illustrates and briefly describes the operation and applications of three types of continuous thickness gages, as follows: Model P for use on thin papers or plastics; Model S for paper, film, rubber, plastics, asbestos, and synthetic materials of the non-magnetic type; and the Beta Ray gage for measuring and indicating any deviations in thickness of strip or sheet materials of any type.

"A History of the Akron Rubber Group." R. H. Crossley and Ralph F. Wolf. January 1, 1949. 10 pages. This history of the Akron Group during its 21 years of existence describes the Group's origination, its growth, and current status. A list of Group officers from 1928 to the present year is also included.

"Customs House Guide." 1949 Edition. Edited by John F. Budd. Published by Custom House Guide, Box 7, Station P, Custom House, New York 4, N. Y. Price, $25 plus postage (includes monthly Bulletin). This newest edition of the Guide, comprising more than 1,600 pages, offers complete information on the new United States import duties; the Internal Revenue Code; port activities, facilities, and charges; a directory for shippers; special sections on Canada and the Philippines; a general information section for importers and exporters; and the U. S. Customs Regulations in current form. To keep the Guide up-to-date, a monthly supplement, "American Import and Export Bulletin," is sent to cover latest regulations, rulings, trade agreements, etc. The company also maintains a free readers' information service for the benefit of subscribers.

"Chemical Engineering Catalog, 1949-50." Thirty-Fourth Edition. Reinhold Publishing Corp., 330 W. 42nd St., New York 18, N. Y. Cloth, 8½ x 11 inches. 1580 pages. This edition of the Catalog, although showing a decrease of 187 pages from the preceding issue, continues to offer comprehensive directory information on equipment and engineering materials for the process industries. The format corresponds to previous editions and consists of an alphabetical index of firms represented, a trade name index, a classified index, and section comprising manufacturers' catalogs.

"Naval Stores Resins in Natural Rubber Tread Stock." Hercules Powder Co., Wilmington, Del. 2 pages. Results are given of an investigation to determine the effects of unmodified and stabilized resins in natural rubber tread compound. Formulations appear together with a graph of oxygen absorption of the test compound and photos of atmospheric cracking of bent rubber specimens after two years of exposure.

"Review of Current Research and Directory of Member Institutions, 1949." Engineering College Research Council, American Society for Engineering Education. Paper, 6 by 9 inches, 186 pages. For sale by F. M. Dawson, College of Engineering, State University of Iowa, Iowa City, Iowa. Price, $1.75. This edition presents classified listing and brief description of more than 4,000 current college and university research projects in engineering subjects. Entries cover 82 institutions and give information on administrative policies on research, expenditures, personnel, courses and conferences of special interest, and titles of research studies currently active.

"Estimation of Small Percentages of Rubber in Fibrous Materials." C. M. Blow, British Rubber Development Board. Pamphlet 7. 4 pages. (1947). **"Progress in 7 Fields of Management—1932-1949."** American Management Association, 330 W. 42nd St., New York, N. Y. 32 pages. **"B. F. Goodrich Football Guide."** B. F. Goodrich Co., Akron, O. 36 pages. **"Testing of Furniture Finishes."** Foster D. Snell, Inc., 29 W. 15th St., New York 11, N. Y. 8 pages. **"General Electric in Your Home."** General Electric Co., Schenectady, N. Y. 16 pages. Publications of Underwriters' Laboratories, Inc., 207 E. Ohio St., Chicago 11, Ill.: **"Lists of Inspected Appliances Relating to Accident Hazard, Automotive Equipment, Burglary Protection.** September, 1949." 104 pages. **"Bi-Monthly Supplement to All Lists of Inspected Appliances, Equipment, Materials.** August, 1949." 90 pages.

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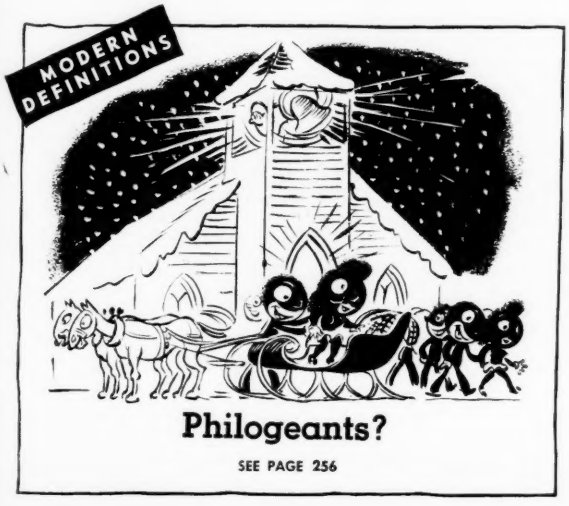

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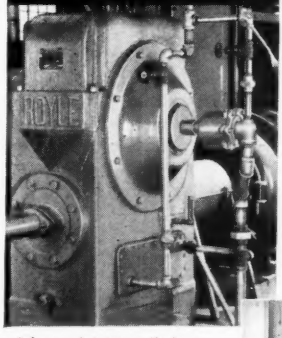

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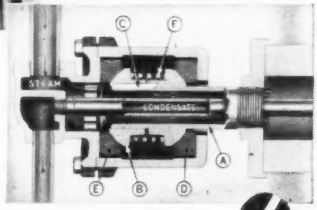

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Market Reviews

CRUDE RUBBER

Commodity Exchange

WEEK-END CLOSING PRICES

	Sept. 30	Oct. 29	Nov. 5	Nov. 12	Nov. 19	Nov. 26
Jan.	15.99	16.29	16.40	16.83	16.74	16.89
Mar.	15.78	16.15	16.35	16.70	16.70	16.85
May	15.50	15.95	16.20	16.56	16.60	16.75
July	16.30	15.75	16.00	16.41	16.45	16.62
Sept.	15.20	15.65	15.90	16.31	16.35	16.52
Nov.	15.10	15.55	15.80	16.21	16.25	16.42
Total weekly sales, tons	4,670	4,620	6,870	2,920	4,910	2,600

RUBBER futures prices moved irregularly upward on the Commodity Exchange during November. Short covering in December and March and a definite trend to switch nearby holdings into May and other distant positions sent prices higher during the first week of the month. These two factors and a wave of speculative buying sent prices up again during the second week in November. Speculation followed news of a fire at a large Liverpool warehouse in which from 4,000 to 7,000 tons of rubber were estimated to have been destroyed. Much of this rubber was thought to be held by dealers against shipment to this country, and, although protected by insurance, the loss resulted in some pressing orders for spot and December delivery on the local market. Some of the rubber was also believed to be Board of Trade stocks, and some replacement buying is expected in Singapore.

A slump in the rubber futures market developed during the third week of November as buyers reacted to the higher prices by going off the market. Prices recovered, however, toward the end of the month and rose again despite lack of interest and only a slight volume of trading. The tight supply of flat bark rubber, originally termed temporary, has turned into a more permanent situation, observers report. However, they say that since the war flat bark has been relatively out of line with better grades and is now returning to its prewar price relation.

January futures started the month at 16.41¢, fell to a low of 16.40¢ on November 4, rose to 16.83¢ on November 10, fell again to 16.44¢ on November 15, then advanced to a high of 16.89¢ on November 25, and closed the month at 16.70¢. Other futures showed similar movement; May futures opened the month at the low of 16.02¢, reached a high of 16.75¢ on November 25, and ended the month at 16.60¢. Despite the inactivity noted toward the end of November, total sales for the month amounted to 21,030 tons, an increase over the October total of 16,260 tons.

New York Outside Market

RUBBER spot prices on the New York Outside Market during November showed advances corresponding to the futures market and resulting from the same factors. Factory interest was irregular and followed the pattern of recent months of decreasing as prices advanced. The 17.00¢ spot price for No. 1 sheets appears to represent an upper limit which, when attained, drives purchasers from the market until prices have fallen off. The sole remaining buyer, the government, has not been purchasing rubber in sufficient quantities to give support to the market.

The spot price for No. 1 sheets started the month at the low of 16.50¢, rose to 16.75¢ on November 10 and 14, fell back to 16.50¢ on November 15, advanced to the high of 17.00¢ on November 21 and 28, and ended the month at 16.88¢. No. 3 sheets showed identical movement at a price level 2¢ a pound lower than No. 1 sheets. No. 2 Brown fluctuated between a low of 14.00¢ and a high of 14.75¢; while flat bark rose from 13.50¢ to 13.75¢ during the month.

WEEK-END CLOSING PRICES

	Sept. 30	Oct. 29	Nov. 5	Nov. 12	Nov. 19	Nov. 26
No. 1 R.S.S.:						
Nov.-Dec.	16.38	16.25	16.50	16.75	16.75	16.88
Jan.-Mar.	16.13	16.13	16.38	16.75	16.63	16.88
No. 3 R.S.S.	15.13	15.00	15.25	15.63	15.75	15.88
No. 2 Brown	14.25	13.88	14.25	14.63	14.63	14.75
Flat Bark	13.25	13.25	13.50	13.63	13.75	13.75

Latices

THE tight *Hevea* latex position continues with numerous buyers still seeking additional supplies, according to Arthur Nolan, Latex Distributors, Inc., writing in Lockwood's November *Rubber Report*. Consumption continues high, and it appears quite likely that a 4,000-ton monthly rate may soon be reached. Consumption of *Hevea* latex in September totaled 3,637 long tons, dry weight; while imports were only 2,144 long tons, and month-end stocks declined to 5,403 long tons.

In the face of existing supply and demand for *Hevea* latex, it is obvious that sufficient latex will not be available to meet all wants during 1949 even at the 3,600-ton per month level without completely exhausting stocks. A consumption rate of 4,000 tons a month might possibly be supported during early 1950, but estimates are complicated with many uncertainties. Increased supplies during the second quarter of 1950 may be sufficient to replenish depleted stocks at the present rate of consumption, but if the demand continues to increase, it may quite likely still be higher than supplies even at that time.

Mr. Nolan sees the only remedy for the tight supply situation to be forward commitment of purchases. This enables the producer to plan ahead without fear of a glut on the market. Producers are presently willing firmly to commit themselves to buyers for January, February, March, and beyond, thus assuring buyers of positive supply and relief from worry.

September production of GR-S latex decreased to 1,725 long tons, dry weight, from the 1,842-ton August figure. Consumption of GR-S latex is expected to increase to replace *Hevea* latex being diverted to meet the growing demand for foam sponge. There were no changes in GR-S latex bulk prices during November, which remained at 18.5-20.25¢ a pound, dry weight. *Hevea* latex bulk prices rose 1¢ a pound to 24.5-26.5¢ in response to high demand and tight supply.

RECLAIMED RUBBER

SALES of reclaimed rubber during November declined to about 9% below the level of the preceding month, probably owing to the continued effect of lower crude rubber market prices. The consumption ratio of reclaim to new rubber for both August and September was equal to the average ratio for the year 1948, but the ratio for October is expected to be lower because of reduced mandatory percentage consumption of GR-S and increased use of natural rubber.

Final August and preliminary September statistics on the domestic reclaimed rubber industry are now available. In August, production totaled 17,813 long tons; consumption, 19,297 long tons; exports, 612 long tons; and month-end stocks, 27,526 long tons. Preliminary figures for September give a production of 18,300 long tons; consumption, 18,412 long tons; exports, 761 long tons; and month-end stocks, 26,224 long tons.

No changes in reclaimed rubber prices occurred during November, and current prices follow:

Reclaimed Rubber Prices

	Sp. Gr.	¢ per lb.
Whole tire	1.18-1.20	8.25/ 8.75
Peel	1.18-1.20	8.25/ 9.25
Inner tube		
Black	1.20-1.22	11.50/12.50
Red	1.20-1.22	14 /14.5
GR-S	1.18-1.20	9.5 /10
Butyl	1.16-1.18	8.5 / 9
Shoe	1.50-1.52	8.25/ 8.75

The above list includes those items or classes only that determine the price basis of all derivative reclaim grades. Every manufacturer produces a variety of special reclaims in each general group separately featuring characteristic properties of quality, workability, and gravity at special prices.

SCRAP RUBBER

SCRAP rubber moved steadily during November, although sales volume was only moderate in nature. There were no changes in the general market picture. Mixed auto tires continued in good demand, with prices rising 50¢ a ton in the East. Demand for other types of scrap rubber was unchanged, and tubes moved regularly to consuming plants. Butler, Buffalo, and some of the Jersey consuming points were reported to be making steady purchases of scrap rubber, but Naugatuck and Chester were said to be out of the market for the time being.

Following are dealers' selling prices for scrap rubber, in carload lots, delivered to mills at points indicated:

	Eastern Points	Akron, O.
	(Per Net Ton)	
Mixed auto tires	$13.00	$13.50
Peelings, No. 1	52.25	52.25
3	30.25	30.25
	(¢ per Lb.)	
Black inner tubes	4.00	4.00
Red passenger tubes	7.00	7.00

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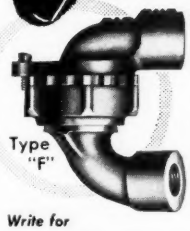

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RAYON

PRODUCERS' shipments of rayon to domestic consumers during October are estimated at 100,400,000 pounds, a new all-time record. Filament yarn shipments were 76,200,000 pounds, comprising 49,000,000 pounds of viscose and cupra, and 27,200,000 pounds of acetate yarn. Of the viscose and cupra total, 23,100,000 pounds were high-tenacity yarn of the type used in tire cords and fabrics. Total domestic production of rayon yarn for tires and related uses during the third quarter of 1949 was 69,800,000 pounds, a decrease of 4% from the second-quarter total, but an increase of 2,300,000 pounds over third-quarter 1948 production.

Total production of cotton, rayon, and nylon tire fabric and cord and cotton chafer fabric in the second quarter of this year amounted to 116,000,000 pounds, 9% below the preceding quarter and 12% below the second quarter of 1948. Of this total, cotton accounted for 35% or 37,000,000 pounds; the remainder was rayon and nylon. The second-quarter output of cotton tire fabric and cord declined 16% from the first quarter of 1949; while the level of rayon and nylon tire fabric and cord production was approximately the same during both quarters.

No changes were made in rayon tire yarn and fabric prices during November, and current prices follow:

Rayon Fabrics

Tire Yarns

1100/480	$0.55
1100/490	.55
1150/490	.55
1650/720	.54
1650/980	.54
1900/980	.54
2200/960	.53
2200/980	.53
4400/2934	.55 / $0.56

Tire Fabrics:

1100/490/2	.67
1650/980/2	.645 / .66
2200/980/2	.63

COTTON AND FABRICS

NEW YORK COTTON EXCHANGE
WEEK-END CLOSING PRICES

Futures	Sept. 24	Oct. 29	Nov. 5	Nov. 12	Nov. 19	Nov. 26
Mar.	29.57	29.84	30.00	29.88	29.71	29.91
May	29.50	29.83	29.91	29.83	29.66	29.88
July	28.96	29.44	29.55	29.49	29.35	29.61
Oct.	27.13	27.91	28.02	28.05	27.93	28.19
Dec.	27.03	27.84	27.94	27.98	27.89	28.12
Mar.	....	27.80	27.91	27.91	27.80	28.07

THE New York Cotton Exchange saw relatively active trading during November, with prices moving through a narrow range. Toward the middle of the month an influx of cotton coupled with increased hedging, profit-taking December liquidations, and some professional bearish operations served to depress prices despite continuing mill demand and foreign fixations. Prices recovered toward the end of the month, with an increase in speculative covering as offerings became more limited.

Mill demand is expected to remain good until well into the second quarter of 1950, on the basis of orders being booked by the mills. The future of foreign cotton buying is more uncertain since ECA nations may lower their cotton buying here if they can cover their needs elsewhere. Some observers believe that even if foreign countris cannot buy cotton elsewhere, they will cut their budgets and require smaller purchases here.

The 15/16-inch middling spot price started the month at 30.54¢, rose to a high of 30.72¢ on November 4, fell to a low of 30.32¢ on November 19, then recovered to end the month at 30.63¢. March futures showed corresponding movement, beginning the month at 29.87¢, reaching a high of 30.05¢ on November 4 and a low of 29.71¢ on November 19, and closing at 29.97¢ on November 30.

Fabrics

Sales of hose and belting ducks were on the increase late in November, and chafers began to move strongly for the first quarter of 1950, following a period of only moderate activity. The steel settlement and good prospects in the automotive field had a stimulating effect on chafers, which sold into January to the tire trade at firm prices. Sateens and broken twills for the coating trade sold into February at unchanged prices, although reports indicate price advances in these fabrics within the near future.

Wide and numbered ducks sold about 30 days ahead, although some spot deliveries were still available in certain constructions. A strong market existed for print cloths and sheetings, with some scarcities beginning to be felt. Osnaburgs sold into March at firm prices, with the bag industry taking the bulk of the goods. Enameling ducks reported good demand and sold at unchanged prices into the first quarter of 1950.

Cotton Fabrics

Drills	
59-inch 1.85-yd. ....yd.	$0.36/$0.365
2.25-yd.	.32/.33
Ducks	
38-inch 1.84-yd. S. F. .....yd.	.425
2.90-yd. D. F.	.31/.325
51.5-inch 1.35-yd. S. F.	.4575/.46
66-inch 1.02-yd. S. F.	.73
Hose and belting	.58
Osnaburgs	
40-inch 2.11-yd. .....yd.	.22
Raincoat Fabrics	
Bombazine, 64x60 5.35-yd. ....yd.	.235
Print cloth, 38½-inch, 64x60....	.17
Sheeting, 48-inch, 4.17-yd.	.21
52-inch 3.85-yd.	.2225
Chafer Fabrics	
14-oz./sq. yd. Pl. .....lb.	.635/.65
11-65-oz./sq. yd. S.	.58/.60
10-80-oz./sq. yd. S.	.62
8.9-oz./sq. yd. S.	.635
14-oz./sq. yd. S.	.59
Other Fabrics	
Headlining, 59-inch 1.35-yd. 2-ply yd.	.565
64-inch 1.25-yd. 2-ply	.6063
Sateens, 53-inch 1.32-yd.	.57
58-inch 1.21-yd.	.6238
Tire Cords	
K. P. std., 12-3-3 .....lb.	.685
12-4-2	.675

CALENDAR

Dec. 16. Chicago Rubber Group. Annual Christmas Party and Ladies' Night, Morrison Hotel, Chicago, Ill.
Dec. 16. New York Rubber Group. Christmas Party. Henry Hudson Hotel, New York, N. Y.
Dec. 16. Boston Rubber Group. Christmas Party. Somerset Hotel, Boston, Mass.
Dec. 16. Northern Indiana Section, SPE. Van Orman Hotel, Fort Wayne, Ind.
Dec. 21. New York Section, SPE. Hotel Shelburne, New York, N. Y.
Jan. 9-15. Bicycle Institute of America, Inc. Annual Convention. Boca Raton Club, Boca Raton, Fla.
Jan. 9. Upper Midwest Section, SPE.
Jan. 11-13. SPE. National Technical Conference. Hotel Carter, Cleveland, O.
Jan. 12. Quebec Rubber & Plastics Group. Canadian Legion Hall, Montreal, P.Q.
Jan. 16-19. Plant Maintenance Show and Conference. Auditorium, Cleveland, O.
Jan. 16-31. "March of Dimes."
Jan. 18. South Texas Section, SPE.
Jan. 20. Northern Indiana Section, SPE. Van Orman Hotel, Fort Wayne, Ind.
Jan. 22-26. National Sporting Goods Association Convention and Show. Hotel Morrison, Chicago, Ill.
Jan. 23. Washington Rubber Group.
Jan. 31. Buffalo Rubber Group. Hotel Westbrook, Buffalo, N. Y.
Feb. 2-4. American Physical Society. Annual Meeting. New York, N. Y.
Feb. 3. Akron Rubber Group. Symposium on New Developments in Rubber Machinery. Mayflower Hotel, Akron, O.
Feb. 6. Philadelphia Section, SPE.
Feb. 10. Quebec Rubber & Plastics Group. Annual Ladies' Night. Town of Mt. Royal Community Hall, Montreal, P.Q., Canada.
Feb. 13. Upper Midwest Section, SPE.
Feb. 15. South Texas Section, SPE.
Feb. 17. Chicago Rubber Group. Morrison Hotel, Chicago, Ill.
Feb. 17. Northern Indiana Section, SPE. Van Orman Hotel, Fort Wayne, Ind.
Feb. 18-26. National Sportsmen's Show. Grand Central Palace, New York, N. Y.
Feb. 24. Detroit Rubber & Plastics Group. Spring Meeting.

New Name for Fiber

(*Continued from page* 324)

readily on conventional machinery; can be handled easily on cotton, wool, worsted, and spun silk systems; and is expected to sell at a moderate price.

Fabrics made of dynel will not support combustion; they will char when ignited, but do not burn further when the source of ignition is removed, it is claimed. The complete mothproofness of dynel is of special interest for apparel, blankets, and floor coverings. The high resilience of dynel fibers contributes unusual and permanent "loft" of fabrics. The fibers are non-felting and make possible materials that will withstand vigorous launderings without loss of fabric resilience. Dynel is light in weight, launders and dry-cleans well without shrinkage, and dries rapidly since the fibers do not absorb water. Dynel fabrics can be steam pressed without loss of qualities, but should not be hot ironed. At present, dynel is available in development quantities, but Carbide will substantially increase production at its South Charleston, W. Va., plant, and the new facilities are expected to be in operation some time during the second quarter of 1950.

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Pumicestone, powdered	lb.	$0.03	/ $0.055
Rottenstone, domestic	ton	36.00	/ 43.00

Accelerators, Organic

A-10	lb.	.40	/ .47
A-19	lb.	.52	/ .58
A-32	lb.	.59	/ .69
A-77	lb.	.42	/ .55
A-100	lb.	.42	/ .55
Accelerator S	lb.	.83	
49	lb.	.44	/ .45
89	lb	1.20	
122	lb.	1.30	
552	lb.	1.80	
808	lb.	.59	/ .61
833	lb	1.13	/ 1.15
Advan	lb.	.55	
Aero AC 50	lb.	.50	/ .56
165	lb.	.37	/ .39
Altax	lb.	.35	/ .37
Arazate	lb.	2.16	
Beutene	lb.	.59	/ .64
B-J-F	lb.	.27	/ .32
Butasan	lb.	1.00	
Butazate	lb.	1.00	
Butyl Eight	lb.	1.00	/ 1.05
Zimate	lb	1.00	
Captax	lb.	.27	/ .345
C-P-B	lb.	1.95	
Cumate	lb.	1.45	
Cuprax	lb.	.60	/ .62
Diesterex N	lb.	.50	/ .57
DOTG (diorthotolyguanidine)	lb.	44	/ .50
DPG (diphenylguanidine)	lb.	.39	/ .45
El-Sixty	lb.	.39	/ .46
Ethasan	lb.	1.00	
Ethazate	lb.	1.00	
Ethyl Thiurad	lb.	1.00	
Tuads	lb.	1.00	
Tuex	lb.	1.00	
Zimate	lb.	1.00	
Good-Rite Erie	lb.	.32	/ .34
Hepteen	lb.	.42	/ .48
Base	lb.	1.80	/ 1.90
Ledate	lb.	1.00	
M-B-T	lb.	.27	/ .33
M-B-T-S	lb.	.35	/ .41
Mertax	lb.	.37	/ 1.44
Methesan	lb.	1.00	
Methazate	lb.	1.00	
Methyl Selenac	lb.	1.60	
Tuads	lb	1.10	
Zimate	lb.	1.00	
Monex	lb.	1.10	
Mono-Thiurad	lb.	1.10	
Morfex 33	lb.	.53	/ .58
O-X-A-F	lb.	.34	/ .39
Pentex	lb.	.74	/ .84
Flour	lb.	.1225	/ .1325
Phenex	lb.	.40	/ .45
Pipazate	lb.	1.53	
Rodform products	lb.	1.00	/ 3.00
Rotax	lb.	.39	/ .41
S. A. 52	lb.	1.10	
57, 62, 67, 77	lb.	1.00	
66	lb.	1.45	
Safex	lb.	1.15	
Santocure	lb.	.55	/ .62
Selazate	lb.	1.45	
Selenac	lb.	1.45	
SPDX-GH	lb.	.64	/ .69
Tellurac	lb.	1.45	
Tepidone	lb.	.55	
Tetrone	lb.	1.25	
A	lb.	1.85	
Thalam	lb.	.75	
Thiofide	lb.	.35	/ .42
Thionex	lb.	1.10	
Thiotax	lb.	.27	/ .34
Thiurad	lb.	1.10	
Thiuram E	lb.	1.00	
M	lb.	1.10	
Trimene	lb.	.54	/ .64
Base	lb.	1.03	/ 1.18
Tuex	lb.	1.10	
2-MT	lb.	.53	/ .55
Ultex	lb.	1.00	/ 1.10
Ureka	lb.	.55	/ .62
Blend B	lb.	.55	/ .62
C	lb.	.52	/ .59
Vulcanex	lb.	.45	
Z-B-X	lb.	2.45	
Zenite	lb.	.33	/ .35
A	lb.	.42	/ .44
B	lb.	.39	/ .41
Special	lb.	.34	/ .36
Zetax	lb.	.33	/ .36

Accelerator-Activators, Inorganic

Lime hydrated	ton	8.50	/ 13.50
Litharge, comml.	lb.	.1325	/ .1425
Eagle, sublimed	lb.	.1475	/ .1485
Red lead, comml.	lb.	.1525	/ .1675
Eagle	lb.	.1575	
White lead, basic	lb.	.1475	/ .1575
Eagle	lb.	.1475	/ .1575
White lead, silicate	lb.	.14⅞	/ .1825
Eagle	lb.	.155	/ .1725
Zinc oxide, comml.†	lb.	.11	/ .135

Accelerator-Activators, Organic

Barak	lb.	$0.60	
Curade	lb.	.57	/ $0.59
D-B-A	lb.	1.95	
Delac P	lb.	.45	/ .52
Emersol 110	lb.	.1325	/ .1425
120	lb.	.1375	/ .1475
130	lb.	.16	/ .17
210 Elaine	lb.	.11	/ .1325
Emery 600	lb.	.09	/ .1125
Guantal	lb.	.47	/ .54
Hyfac 430	lb.	.145	/ .155
431	lb.	.155	/ .165
Laurex	lb.	.28	/ .31
Lead oleate	lb.	.24	
MODX	lb.	.295	/ .345
NA-11	lb.	.65	
Palmalene	lb.	.35	
Plastone	lb.	.27	/ .30
Polyac	lb.	1.40	
Ridacto	lb.	.22	/ .24
Seedine	lb.	.1485	/ .1705
SOAC-KL	lb.	.08	/ .11
Stearex Beads	lb.	.14¾	/ .15⅞
Stearic acid, single pressed	lb.	.1325	/ .1425
Double pressed	lb.	.1375	/ .1475
Triple pressed	lb.	.16	/ .17
Stearite	lb.	.09	/ .10
Tonox	lb.	.50	/ .59
Zinc stearate	lb.	.34	/ .36

Alkalies

Caustic soda, flake	100 lbs.	3.45	/ 6.67
Liquid, 50%	100 lbs.	2.40	/ 2.50
Solid	100 lbs.	3.05	/ 6.27

Antioxidants

AgeRite Alba	lb.	2.20	/ 2.30
Gel	lb.	.58	/ .60
H.P.	lb.	.61	/ .63
Hipar	lb.	.82	/ .84
Powder	lb.	.46	/ .48
Resin	lb.	.63	/ .65
D	lb.	.46	/ .48
Stalite	lb.	.46	/ .48
White	lb.	1.40	/ 1.50
Akroflex C	lb.	.61	/ .63
Albasan	lb.	.69	/ .73
Aminox	lb.	.46	/ .55
Antisol	lb.	.23	/ .24
Antox	lb.	.46	/ .48
Aranox	lb.	2.15	
Betanox Special	lb.	.68	/ .77
B-L-E	lb.	.46	/ .55
Powder	lb.	.61	/ .70
B-X-A	lb.	.43	/ .52
Copper Inhibiter X-872-L	lb.	1.75	
Deenex	lb.	.95	/ 1.05
Flectol H	lb.	.46	/ .53
Flexamine	lb.	.61	/ .70
Heliozone	lb.	.25	/ .26
NBC	lb.	1.50	
Neozone (standard)	lb.	.66	/ .68
A	lb.	.48	/ .50
C	lb.	.52	/ .54
D	lb.	.46	/ .48
DL	lb.	.48	/ .50
Parazone	lb.	.75	
Perflectol	lb.	.61	/ .68
Permalux	lb.	1.65	
Rio Resin	lb.	.50	/ .52
Santoflex 35	lb.	.61	/ .68
B	lb.	.46	/ .53
Santovar-O	lb.	1.10	/ 1.17
Santowhite Crystals	lb.	1.65	/ 1.72
MK	lb.	1.40	/ 1.52
MKS	lb.	1.25	/ 1.37
S.C.R.	lb.	.32	/ .34
Stabilite	lb.	.46	/ .48
Alba	lb.	.69	/ .74
L	lb.	.48	/ .50
Sunolite	lb.	.20	
Sunproof	lb.	.25	/ .30
Improved	lb.	.23	/ .28
Jr	lb.	.18	/ .23
Thermoflex A	lb.	.82	/ .84
Tonox	lb.	.50	/ .59
Tysonite	lb.	.215	/ .2225
V-G-B	lb.	.55	/ .64
Zenite	lb.	.33	/ .35

Antiseptics

Copper naphthenate, 6-8%	lb.	.2225	
G-4	lb.	1.15	/ 2.70
G-11	lb.	3.50	
Pentachlorophenol	lb.	.20	/ .25
Resorcinol, technical	lb.	.62	/ .75
Soligen Drier-Copper 8%	lb.	.2325	
-Zinc 8%	lb.	.22	
Zinc naphthenate, 8-10%	lb.	.2075	/ .255

Blowing Agents

Ammonium, bicarbonate	lb.	.055	/ .06
Carbonate	lb.	.185	/ .22
Sodium bicarbonate	100 lbs.	1.95	/ 3.00
Carbonate, technical	100 lbs.	1.10	/ 5.02
Unicel	lb.	.60	
ND	lb.	1.50	
S	lb.	.25	

*Prices in general are f.o.b. works. Range indicates grade or quantity variations. Space limitation prevents listing of all known ingredients. Prices are not guaranteed; contact suppliers for spot prices.

†For trade names, see Color—White, Zinc Oxide.

Bonding Agents

MDI	lb.	$7.00	/ $7.75
50	lb.	3.50	/ 4.00
Ty-Ply Q, S	gal.	6.75	/ 8.00

Brake Lining Saturants

B.R.T. No. 3	lb.	.024	/ .025
Resinex L-S	lb.	.0225	/ .03

Carbon Blacks

Conductive Channel—CC

Continental R-20, -40	lb.	.15	/ .22
Kosmos/Dixie	lb.	.15	/ .185
Spheron C	lb.	.12	/ .165
N	lb.	.22	/ .25
Voltex	lb.	.15	/ .185

Easy Processing Channel—EPC

Continental AA	lb.	.069	/ .1125
Kosmobile 77/Dixiedensed 77	lb.	.07	/ .1125
Micronex W-6	lb.	.065	/ .1175
Spheron #9	lb.	069	/ .117
Texas E	lb.	.065	/ .1075
Witco #12	lb.	.069	/ .1125
Wyex	lb.	.069	/ .115

Hard Processing Channel—HPC

Continental F	lb.	.069	/ .1125
HX	lb.	.069	/ .115
Kosmobile S/Dixiedensed S	lb.	.07	/ .1175
Micronex Mk. II	lb.	.065	/ .1125
Spheron #4	lb.	.069	/ .117
Witco #6	lb.	.069	/ .1125

Medium Processing Channel—MPC

Arrow TX	lb.	.069	/ .115
Continental A	lb.	.069	/ .1125
Kosmobile S-66/Dixiedensed S-66	lb.	.07	/ .1175
Micronex Standard	lb.	.065	/ .1125
Spheron #6	lb.	.069	/ .117
Texas M	lb.	.065	/ .1075
Witco #1	lb.	.069	/ .1125

Conductive Furnace—CF

Statex A	lb.	.08	/ .10

Fast Extruding Furnace—FEF

Statex M	lb.	.0525	/ .095

Fine Furnace—FF

Statex B	lb.	.055	/ .0975
Sterling 99	lb.	.065	/ .105
105	lb.	.12	/ .16

High Abrasion Furnace—HAF

Aromex	lb.	.074	/ .1125
Philblack O	lb.	.07	/ .1145
Vulcan #1, #3	lb.	.074	/ .117

High Modulus Furnace—HMF

Continex HMF	lb.	.05	/ .09
Kosmos 40/Dixie 40	lb.	.05	/ .09
50/Dixie 50	lb.	.055	/ .095
Modulex	lb.	.05	/ .075
Philblack A	lb.	.0525	/ .095
Statex 93	lb.	.0475	/ .09
Sterling L	lb.	.05	/ .09
SO	lb.	.055	/ .095

Reinforcing Furnace—RF

Kosmos 60/Dixie 60	lb.	.074	/ .1125

Semi-Reinforcing Furnace—SRF

Continex SRF	lb.	.035	/ .075
Essex	lb.	.035	/ .055
Furnex	lb.	.0325	/ .075
Non-staining	lb.	.035	/ .0775
Gastex	lb.	.035	/ .075
Kosmos 20/Dixie 20	lb.	.035	/ .075
Pelletex	lb.	.035	/ .075
Sterling NS, R, S	lb.	.035	/ .075

Very Fine Furnace—VFF

Statex K	lb.	.07	/ .1125

Fine Thermal—FT

P-33	lb.	.05	

Medium Thermal—MT

Thermax	lb.	.03	
Stainless	lb.	.035	

Chemical Stabilizers

Lead stearate	lb.	.36	/ .38
Staflex OY	lb.	1.75	
QMXA	lb.	.60	
Vanstay 16, 25	lb.	.33	/ .35
White lead, basic	lb.	.1475	/ .1575

Colors

Black

Black Paste #25	lb.	.22	/ .40
BK Iron Oxides	lb.	.03	/ .11
Lampblack, comml.	lb.	.07	/ .30
Superjet	lb.	.0675	/ .1025
Mapico	lb.	.1075	/ .11
MB Mineral Blacks	lb.	.0315	/ .0675

Blue

Du Pont	lb.	1.54	/ 3.95
Heveatex pastes	lb.	.80	/ 1.45
Stan-tone	lb.	1.00	/ 1.35
Toners	lb.	.30	/ 3.50
Vansul Blue M.B.	lb.	.80	/ 2.45

Brown

Brown Paste #5, #10	lb.	.35	/ .45
Iron oxide, brown	lb.	.03	/ .125
Mapico	lb.	.125	
Tan	lb.	.195	
Metallic brown	lb.	.03	/ .04

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"American"

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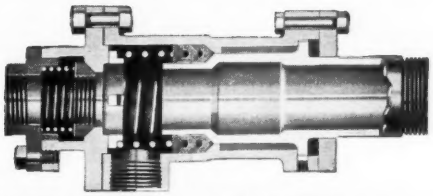

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Pacific Rep.: Lombard Smith, Los Angeles, Cal.

Plastics brown	lb.	$0.0565	/ $0.065
Sienna, burnt	lb.	.0375	/ .15
Raw	lb.	.04	/ .1275
Umber, burnt	lb.	.0475	/ .08
Raw	lb.	.0375	/ .0625
Green			
Chrome	lb.	.13	/ .4775
Oxide	lb.	.33	/ .40
Du Pont	lb.	1.50	/ 3.20
G-4099, -6099	lb.	.34	/ .355
G-7599	lb.	.405	/ .42
GH-9869	lb.	.85	/ 1.00
GN-9676	lb.	.95	/ 1.10
Hevecatex pastes	lb.	.95	/ 1.85
Stan-Tone	lb.	1.50	/ 3.30
Toners	lb.	.35	/ 4.00
Vansul Green M.B.	lb.	.85	/ 2.25
Orange			
Du Pont	lb.	2.75	
Orange Paste #13	lb.	1.35	/ 1.50
Stan-Tone	lb.	1.65	/ 2.25
Toners	lb.	.30	/ 1.50
Vansul Orange M.B.	lb.	2.15	/ 2.95
Red			
Antimony trisulfide	lb.	.55	/ .68
R. M. P. Sulfur Free	lb.	.63	/ .68
R. P. M. No. 3	lb.	.55	/ .60
Cadmium red lithopone	lb.	1.15	/ 1.55
Cadmolith Red	lb.	.92	/ 1.00
Du Pont	lb.	1.15	/ 1.65
Indian Red	lb.	.115	/ .1375
Iron oxide, red	lb.	.0525	/ .1175
Light	lb.	.115	/ .1175
Mapico	lb.	.115	/ .1175
Red Paste #17, I-2	lb.	.95	/ 1.10
Rub-Er-Red	lb.	.0975	
Stan-Tone	lb.	1.10	/ 3.05
Toners	lb.	.25	/ 4.15
Tuscan Red	lb.	.245	/ .25
Vansul Red M.B.	lb.	.80	/ 2.45
Venetian Red	lb.	.035	/ .049
White			
Antimony oxide	lb.	.27	/ .28
Burgess Iceberg	ton	50.00	
Lithopone, titanated	lb.	.0825	/ .085
Cryptone BT	lb.	.0825	/ .085
Titanium pigments:			
Rayox LW	lb.	.195	/ .205
R-110	lb.	.215	/ .225
Ti-Cal	lb.	.075	/ .0825
Ti-Pure	lb.	.195	/ .225
Titanox-A, -AA	lb.	.195	/ .20
RA, RA-10	lb.	.0775	/ .0825
RC	lb.	.215	/ .225
RC-HT	lb.	.075	/ .08
Zopaque	lb.	.195	/ .205
Zinc oxide, comml	lb.	.11	/ .135
Azo ZZZ-11, -44, -55	lb.	.11	/ .1125
-66	lb.	.1325	/ .135
35% leaded	lb.	.1275	/ .12
Eagle AAA, lead free	lb.	.12⅛	/ .12⅝
5% leaded	lb.	.11	/ .1125
35% leaded	lb.	.1175	/ .12
50% leaded	lb.	.12⅛	/ .12⅜
Florence Green Seal-8	lb.	.1275	/ .13
Red Seal-9	lb.	.1225	/ .125
White Seal-7	lb.	.1325	/ .135
Horsehead XX-4, -78	lb.	.11	/ .1125
Kadox-15, 17, -72	lb.	.11	/ .1125
-25	lb.	.1325	/ .135
Lehigh, 35% leaded	lb.	.1175	/ .12
50% leaded	lb.	.12⅛	/ .12⅜
Protox-166	lb.	.11	/ .1125
St. Joe, lead free	lb.	.11	/ .1125
Standard, 5% leaded	lb.	.11	/ .1125
Zinc sulfide, comml	lb.	.1325	/ .135
Cryptone ZS-800	lb.	.1325	/ .135
Yellow			
Cadmium yellow lithopone	lb.	.95	
Cadmolith Yellow	lb.	.92	/ .100
Chrome	lb.	.32	/ .34
Du Pont	lb.	1.35	/ 1.85
Iron oxide, yellow	lb.	.0141	/ .0925
Mapico	lb.	.09	/ .0925
Ocher, yellow	lb.	.0125	/ .0275
Stan-Tone	lb.	1.00	/ 1.55
Toners	lb.	.50	/ 1.37
Vansul Yellow M.B.	lb.	.90	/ 1.15
Yellow D	lb.	1.25	/ 1.35
Dispersing Agents			
Darvan Nos 1, 2	lb.	.21	/ .30
Daxad Nos. 11, 23, 27	lb.	.19	/ .35
No. 21	lb.	.08	/ .25
Stan-Chem	lb.	.1225	/ .2587
Triton R-100	lb.	.12	/ .25
Dusting Agents			
Extrud-o-Lube, conc	gal.	1.57	
Glycerized Liquid Lubricant, concentrated	gal.	1.25	
Lubrex	lb.	.25	/ .30
Mica	lb.	.0675	/ .075
Pyrax A	ton	12.50	/
W. A	ton	15.00	
Snow Crest Talc	ton	33.00	/ 35.00
Vanfre	gal.	2.00	/ 2.50
Zinc stearate	lb.	.34	/ .36
Extenders			
Advagum	lb.	.65	
B. R. S. 700	lb.	.0175	/ .026
B. R. T. No. 7	lb.	.0265	/ .0275
Califlux 510, 550	lb.	$0.025	/ $0.0325
G. P	lb.	.0125	/ .02
Dielex B	lb.	.06	
Factice, Amberex	lb.	.30	/ .38
Brown	lb.	.12	/ .33
Neophax	lb.	.18	/ 1.35
Ozonite	lb.	.2365	
White	lb.	.13	/ .32
G. B. Asphaltenes	lb.	.06	/ .065
Mineral Rubbers			
Black Diamond	ton	38.00	/ 40.00
Extender 600	lb.	.18	
Hard Hydrocarbon	ton	38.00	/ 40.00
No. 38	ton	38.00	/ 40.00
Parmr	ton	21.00	/ 29.00
Nuba No. 1, 2	lb.	.04	
No. 3X	lb.	.065	
Rubber substitute, brown	lb.	.18	/ .317
White	lb.	.16	/ .33
Synthetic 100	lb.	.41	
Vinsol Resin	lb.	.0385	/ .0785
Vistanex	lb.	.32	
Fillers, Inert			
Asbestos fiber	ton	19.00	/ 88.00
Barytes, floated, white	ton	35.05	/ 49.65
Off-color, domestic	ton	19.00	/ 20.00
No. 1	ton	34.85	/ 49.65
2	ton	32.85	/ 47.65
Blanc fixe	ton	77.50	/ 113.00
Clays:			
Albacar	ton	40.00	/ 50.00
Aluminum Flake	ton	16.00	/ 22.00
#5	ton	21.00	
Champion	ton	14.00	
Crown	ton	14.00	/ 33.00
Hi-White R	ton	15.00	/ 33.00
Hydratex R	ton	30.00	
Paragon	ton	13.50	/ 31.50
McNamee	ton	13.50	
Stan-Tex White	ton	25.00	
Stellar-R	ton	50.00	
Suprex	ton	14.00	/ 33.00
W-1291 English	ton	53.00	/ 55.00
Witco #1	ton	14.00	/ 30.00
#2	ton	13.50	/ 30.00
Cryptone BA, CB, MS	lb.	.08	/ .0825
Flocks:			
Cotton, dark	lb.	.095	/ .112
Dyed	lb.	.45	/ .85
White	lb.	.12	/ .20
Fabrifil X-24-G	lb.	.095	
X-24-W	lb.	.135	
Filfloc 6000	lb.	.16	
F-40-900	lb.	.105	
Solka-Floc	lb.	.05	/ .15
Kalite	ton	40.00	
Lead sulfate, basic	lb.	.14	/ .15
Lithopone, comml	lb.	.0625	/ .06⅝
Albalith	lb.	.0625	/ .065
Astrolith	lb.	.06⅜	/ .0675
Eagle	lb.	.0725	/ .075
Sunolith	lb.	.06⅜	/ .0675
Mica	lb.	.0675	/ .075
No. 1 Silica	ton	22.00	/ 40.00
Pyrax A	ton	12.50	
W. A	ton	15.00	
Silical	ton	7.00	/ 55.00
SL Slate Flour	ton	17.00	/ 25.00
Suspenso	ton	22.00	
Swansdown	ton	20.00	
Terra Alba 1319	ton	27.00	
Ti-Cal	lb.	.0675	
Titanox-C, RCHT	lb.	.07	/ .075
Whiting, limestone	ton	6.00	/ 15.00
Paxinosa	ton	8.00	/ 14.50
Witco	ton	8.50	
Finishes			
Black-Out	gal.	4.50	/ 8.00
Flexible Rubber Paints	gal.	4.00	/ 9.00
Flocks			
Cotton, dark	lb.	.095	/ .112
Dyed	lb.	.45	/ .85
White	lb.	.12	/ .20
Rayon, colored	lb.	.90	/ 1.50
White	lb.	.75	/ 1.25
Rubber lacquer, clear	gal.	1.00	/ 2.00
Colored	gal.	2.00	/ 3.50
Shoe varnish	gal.	1.45	
Talc	ton	14.00	/ 35.00
Vinylum #45	lb.	1.50	/ 1.65
Wax, Bees	lb.	.45	/ .65
Carnauba	lb.	.83	/ 1.13
Montan	lb.	.19	/ .32
No. 118, colors	gal.	.86	/ 1.41
Neutral	gal.	.76	/ 1.31
Van Wax	gal.	1.25	/ 1.30
Latex Compounding Ingredients			
Accelerator 89	lb.	1.20	
122	lb.	1.30	
552	lb.	1.80	
Acrysol GS, 15% solids	lb.	.13	/ .185
Advawet 10	lb.	.35	
Aerosol	lb.	.35	
AgeRite Dispersions	lb.	.60	/ 2.25
Amberex Solutions	lb.	.1675	/ .18
Aquablaks	lb.	.0775	/ .165
Aquarex BBX, Conc	lb.	.78	
D	lb.	.76	
MDL Paste	lb.	.30	
ME	lb.	.92	
NS	lb.	.60	
SMO	lb.	.50	
WA Paste	lb.	.25	
Areskap 50	lb.	.30	/ .38
100, dry	lb.	.60	/ .72
Aresket 240	lb.	.30	/ .38
300, dry	lb.	.60	/ .72
Aresklene 375	lb.	$0.42	/ $0.57
400, dry	lb.	.70	/ .84
Black No. 25, dispersed	lb.	.22	
Casein	lb.	.1875	/ .28
CW-12	lb.	.85	
CW-37	lb.	.70	
Darex Copolymers Nos. 3-L, 9-L, X34-L, X44-L	lb.	.365	/ .50
DC Antifoam A	lb.	6.00	/ 6.65
Dispersed Sulfur No. 2	lb.	.10	/ .12
Ethyl Thiurad	lb.	1.00	
Factice dispersions	lb.	.23	/ .44
Laton L	lb.	.075	/ .0775
Ludox	lb.	.1675	/ .1925
Marmix	lb.	.36	/ .43
Methocel	lb.	.62	/ .80
Micronex, colloidal	lb.	.06	/ .07
Pip-Pip	lb.	1.80	
R-2 Crystals	lb.	1.75	
Resin Emulsion A-155	lb.	.13	/ .18
P-370	lb.	.125	/ .175
Resin V	lb.	.13	
Santomerse D	lb.	.43	/ .65
S	lb.	.12	/ .25
Setsit No. 5	lb.	.75	/ 1.00
SPDX-GL	lb.	.95	
Stablex A	lb.	.90	/ 1.10
B	lb.	.50	/ .95
G	lb.	.50	/ .70
L	lb.	.30	/ .40
Sulfur Dispersion, 50%	lb.	.07	/ .15
66%	lb.	.09	/ .17
73%	lb.	.10	/ .12
Tergitol wetting agents	lb.	.265	/ .37
Triton R-100	lb.	.1375	/ .2425
Zinc oxide, dispersed	lb.	.13	/ .20
Mold Lubricants			
Aluminum stearate	lb.	.30	/ .31
Aquarex D	lb.	.76	
L Paste	lb.	.85	
MDL Paste	lb.	.30	
WA Paste	lb.	.25	
Carbowax compounds	lb.	.24	/ .35
Colite Concentrate	gal.	.90	/ 1.15
ELA	lb.	.80	
DC Mold Release Fluid	lb.	4.90	/ 6.00
Emulsion Nos. 35, 35A	lb.	1.84	/ 3.50
DC 7	lb.	6.20	/ 6.80
Glycerized Liquid Lubricant, concentrated	gal.	1.25	
Lubrex	lb.	.25	/ .30
Mica	lb.	.0675	/ .075
Mold Paste	lb.	.25	
Monten Wax	lb.	.57	
Para Lube	lb.	.046	/ .048
Sodium stearate	lb.	.40	/ .56
Stearite	lb.	.09	/ .10
Talc	ton	14.00	/ 35.00
Vanfre	gal.	2.00	/ 2.50
Odorants			
B-3223	lb.	2.50	
Coumarin	lb.	2.75	/ 3.05
Curodex 19	lb.	4.75	
188	lb.	5.75	
198	lb.	6.75	
GD-4440	lb.	3.50	
-5280, -5424, -53481	lb.	2.50	
-5296	lb.	1.25	
-5386	lb.	2.00	
Parador A	lb.	2.25	
C	lb.	3.25	
E	lb.	.55	
F	lb.	.47	
I	lb.	2.00	
K	lb.	.43	
Resador Nos. 1, 5	lb.	2.50	
No. 10	lb.	.40	
Rodo No. 0	lb.	4.00	/ 4.50
No. 10	lb.	5.00	/ 5.50
Vanillin	lb.	3.00	/ 4.05
Plasticizers and Softeners			
Akroflex C	lb.	.61	/ .63
Aro Lene #1980	lb.	.10	/ .12
Bardol	lb.	.0225	/ .0325
B	lb.	.055	/ .0575
639	lb.	.0225	/ .04
Bondogen	lb.	.55	/ .60
BRC 20	lb.	.0125	/ .0135
30	lb.	.011	/ .0195
521	lb.	.0175	/ .0185
B. R. H. No. 2	lb.	.02	/ .029
B. R. S. 700	lb.	.02	/ .026
R. R. T. No. 4	lb.	.0225	/ .0235
B. R. V	lb.	.0325	/ .049
Bunarax resins	lb.	.06	/ .129
Bunnatol G. S	lb.	.40	/ .505
Butac	lb.	.105	/ .115
BxDC	lb.	.40	/ .41
Califlux 500, 550	lb.	.025	/ .03
G P	lb.	.0125	/ .0225
R-100	lb.	.05	/ .05
TT	lb.	.02	/ .0275
Carbonex	lb.	.0325	/ .0375
664	lb.	.0375	/ .0425
645	lb.	.036	/ .0385
S	lb.	.04	/ .045
S Plastic	lb.	.0385	/ .0435
Contogums	lb.	.0875	/ .111
Cumar EX	lb.	.0525	
MH	lb.	.065	/ .11
V	lb.	.0975	/ .1275
Dielex B	lb.	.06	
Dipentene, American	gal.	.35	
Sunny South	gal.	.35	
Dipolymer Oil	gal.	.33	/ .38

CLASSIFIED ADVERTISEMENTS

ALL CLASSIFIED ADVERTISING MUST BE PAID IN ADVANCE

Effective July 1, 1947

GENERAL RATES
Light face type $1.25 per line (ten words)
Bold face type $1.60 per line (eight words)
Allow nine words for keyed address.

SITUATIONS WANTED RATES
Light face type 40c per line (ten words)
Bold face type 55c per line (eight words)

Address All Replies to New York Office at 386 Fourth Avenue, New York 16, N. Y.

SITUATIONS OPEN RATES
Light face type $1.00 per line (ten words)
Bold face type $1.40 per line (eight words)
Letter replies forwarded without charge, but no packages or samples.

SITUATIONS WANTED

CHIEF CHEMIST, FULLY EXPERIENCED IN ADMINISTRATION, direction, and pursuit of research-developments, through production and processing controls. Mechanical goods, sponge rubbers, latex and neoprene foams. Excellent academic training and industrial experiences in synthetic organic chemistry. Comprehensive resume for your consideration. Available immediately. Location immaterial. Address Box No. 462, care of INDIA RUBBER WORLD.

RUBBER CHEMIST, 20 YEARS' WIDE EXPERIENCE IN COMpounding, raw materials, and all factory operations, is looking for new connection. 45 years old, Ph.D. Factory, laboratory, or technical sales. Address Box No. 463, care of INDIA RUBBER WORLD.

RUBBER AND LATEX CHEMIST, SIX YEARS' COMPOUNDING, production and supervisory experience in the manufacture of dipped and molded latex hollow goods and press-molded items, desires position commuting distance North Jersey area. Age 28; family; salary $4,500. Address Box No. 464, care of INDIA RUBBER WORLD.

RUBBER ENGINEER—14 YEARS' EXPERIENCE IN PRODUCT and process development and quality control on tires, tubes, mechanicals, hose, and special items. Accustomed to accepting responsibility with good record of accomplishment. Desire connection with progressive organization. Age 42, married, employed. Available January 1. Address Box No. 465, care of INDIA RUBBER WORLD.

TECHNICAL SUPERINTENDENT OR CHEMIST—UNIVERSITY graduate, desires connection with progressive company. Long experience in all the major lines of rubber manufacture. Location immaterial. Address Box No. 466, care of INDIA RUBBER WORLD.

RUBBER CHEMIST—PRESENTLY EMPLOYED, DESIRES NEW connection with a stable and progressive firm. Eight years' experience in hose and belt design and manufacture. Age 34. Address Box 473, care of INDIA RUBBER WORLD.

SUPERINTENDENT—CHEMIST, 20 YEARS' EXPERIENCE IN mechanical rubber specialties, extruded and press goods, calendered rubber coating and vinyl film. Address Box No. 474, care of INDIA RUBBER WORLD.

CHEMIST-SUPERINTENDENT WITH 20 YEARS' EXPERIENCE in compounding, development, and factory management for tires, tubes, molded and extruded parts, rayon fabric preparation, printer's rolls, flooring, of natural and synthetic rubbers. Production or technical sales. Address Box No. 478, care of INDIA RUBBER WORLD.

SUPERINTENDENT-CHEMIST DESIRES NEW CONNECTIONS. Capable as technical manufacturing supervisor, or assistant factory manager in charge of costs of manufacturing. Background is 20 years of intensive activity in the manufacture of all types of mechanical rubber products. Address Box No. 479, care of INDIA RUBBER WORLD.

BUSINESS OPPORTUNITIES

PATENTS AVAILABLE TO MANUFACTURERS OF SYRINGES on an exclusive royalty basis covering a flexible pipe attachable to any syringe, approved and endorsed by nationally known cancer specialists. Can be seen by principals in New York City by appointment. Address Box No. 470, care of INDIA RUBBER WORLD.

WANTED TO ESTABLISH A SALES AGENCY IN GREATER New York with a mechanical rubber manufacturer. Have sales office and storage space available. Principals have had 30 years' experience in both manufacturing and sales of mechanical rubber goods. Address Box 471, care of INDIA RUBBER WORLD.

WANTED — Large engineering firm wishes to acquire several complete Rubber Plants through purchase of (1) capital stock, (2) assets, (3) machinery and equipment, whole or in part. Personnel retained where possible, strictest confidence. Box 1220, 1474 Broadway, New York 18, N. Y.

WANTED

RUBBER PRODUCTS PATENTS desired; large national mechanical Manufacturer; confidential. Complete details first letter.

Address Box No. 341, care of INDIA RUBBER WORLD.

SITUATIONS OPEN

PRODUCTS DEVELOPMENT CHEMIST

Must have detailed industrial knowledge to develop, with the aid of our laboratories, new products that will solve definite industrial problems. Must have contacts and experience in specific industries so that such products can be field-tested. This offer is made by a well-established Eastern organic chemical manufacturer with excess plant capacity. Salary and liberal bonus commensurate with ability. Address Box No. 461, care of India RUBBER WORLD.

EXPERIENCED FOREMAN — PREFERABLY WITH BACKground of compounding and development. Wanted by old-established eastern concern for department manufacturing molded, extruded, lathe cut, miscellaneous products, and roll covering. Address Box No. 467, care of INDIA RUBBER WORLD.

RUBBER CHEMIST WITH SEVERAL YEARS' EXPERIENCE IN compounding development and factory processing. Wanted by old-established eastern concern manufacturing mechanical rubber goods. Address Box No. 468, care of INDIA RUBBER WORLD.

MAN 30-40 YEARS OF AGE WITH SUPERVISORY EXPERIENCE in calendering rubber and vinyl resin compounds, preferably with engineering training for methods work directed at scrap reduction. Plant located in New England. Address Box No. 469, care of INDIA RUBBER WORLD.

PRODUCTION MAN TO TAKE FULL CHARGE OF ORGANOSOL, vinyl, and pyroxylin coating plant. Must be thoroughly experienced in this field. Exceptional opportunity for the right party. Plant located in Metropolitan area. Only those with thorough knowledge will be considered. Write present connections, if any. All information held in strict confidence. Immediate opening. Address Box No. 475, care of INDIA RUBBER WORLD.

MANAGER TO OPERATE EXPANDING MIDWEST RUBBER plant manufacturing mechanical molded goods. Must have experience in handling men, manufacturing and molding methods, molds, trimming and handling equipment. Applicant must have had successful record. Address Box No. 476, care of INDIA RUBBER WORLD, giving full information including complete personal history, positions held, etc.

PRODUCTION CHEMIST FAMILIAR WITH PROCESSING AND compounding for rubber plant making mechanical molded products. Experienced in handling men and familiar with latest materials and techniques. Applicant must have proven record. Address Box No. 477, care of INDIA RUBBER WORLD, giving complete history.

CONSULTANTS & ENGINEERS

BERLOW AND SCHLOSSER CO.
Consultation and Technical Service
Paper, Textile and Wringer Rolls—Mechanicals
Molded Specialties—Cut Rubber Thread
401 INDUSTRIAL TRUST BUILDING
PROVIDENCE 3, R. I.

FOSTER D. SNELL, INC.
Our chemical, bacteriological, engineering and medical staff with completely equipped laboratories are prepared to render you Every Form of Chemical Service.
Ask for Booklet No. 15, "The Chemical Consultant and Your Business"
29 W. 15th St. **New York 11, N. Y.**

(Classified Advertisements Continued on Page 373)

Dispersing Oil No. 10	lb.	$0.0525	/ $0.055
Duraplex C-50 LV, 100%	lb.	.25	/ .295
Dutrex 6	lb.	.025	/ .035
Emersol 110	lb.	.1325	/ .1425
120	lb.	.1375	/ .1475
130	lb.	.16	/ .17
210 Elaine	lb.	.11	/ .1325
Emery 600	lb.	.09	/ .1125
Flexol Plasticizer 3GH	lb.	.42	/ .44
3GO	lb.	.515	/ .535
4GO	lb.	.36	/ .38
8N8	lb.	.375	/ .395
DOP	lb.	.43	/ .455
R-I	lb.	.47	/ .475
TOF	lb.	.47	/ .49
TWS	lb.	.405	/ .425
Galex W-100	lb.	.135	/ .1725
W-100D	lb.	.1325	/ .17
G. B. Light Process Oil	lb.	.025	/ .0325
Naphthenic Neutrals	gal.	.11	/ .18
Heavy Resin Oil	lb.	.0225	/ .0375
Hercolyn	lb.	.1112	/ .1347
Hyfac 430	lb.	.145	/ .155
431	lb.	.155	/ .165
Indonex	gal.	.11	/ .17
JMH	lb.	.65	/ .68
Monoplex DBS	lb.	.56	/ .57
DOA	lb.	.435	/ .445
DOS	lb.	.58	/ .59
5	lb.	.70	/ .71
Nevillac oils	lb.	.33	
Resins	lb.	.31	/ .45
Neville LX-685	lb.	.12	
R Resins	lb.	.105	/ .155
Nevinol	lb.	.17	
Nevoll	lb.	.0325	/ .0425
No. 1-D heavy oil	lb.	.055	
Palmalene	lb.	.15	
Para Flux, regular	gal.	.10	/ .2025
No. 2016	gal.	.165	/ .24
Heavy	gal.	.155	
Para Resins	lb.	.04	/ .045
Paradene Resins	lb.	.065	/ .075
Para Lube	lb.	.046	/ .048
Paraplex AL-111	lb.	.33	/ .3375
G-25	lb.	.76	/ .77
-40	lb.	.43	/ .44
-50	lb.	.395	/ .405
-60	lb.	.395	/ .405
Peptizene #2	lb.	.90	
Pepton 22	lb.	.72	/ .75
Picco-10, -25	lb.	.12	/ .17
-75, -100	lb.	.115	/ .17
480 Oilproof resin	lb.	.13	
S. O. S.	gal.	.29	/ .34
Piccocizer 30	lb.	.055	/ .06
Piccolastic Resins	lb.	.139	/ .275
Piccolyte Resins	lb.	.15	/ .2075
Piccoumaron Resin 427-R	lb.	.12	/ .17
Resins	lb.	.06	/ .17
Piccovars	lb.	.12	/ .125
Piccovol	lb.	.025	/ .04
Pictar	gal.	.25	/ .30
Pigmentar	gal.	.035	/ .045
Pigmentaroil	gal.	.035	/ .045
Pine Oil, American	gal.	.45	/ .55
Sunny South	gal.	.45	/ .55
Plastender S	lb.	.0375	/ .04
Plasticizer 35	lb.	.205	/ .24
36	lb.	.305	/ .34
42	lb.	.34	/ .40
2175	lb.	.46	/ .56
3425	lb.	.605	
3497	lb.	.61	
3560	lb.	.56	
B	lb.	.35	/ .45
SC	lb.	.50	/ .57
Plastoflex #3, SC	lb.	.50	
#50	lb.	.38	
FP-6	lb.	.52	
Plastogen	lb.	.0775	/ .08
Plastolein	lb.	.32	/ .53
Plastone	lb.	.22	/ .30
PS-60 Resin	lb.	.35	
PT67 Light Pine Oil	gal.	.50	/ .60
101 Pine Tar Oil	lb.	.035	/ .045
400 Light Pine Tar	lb.	.035	/ .045
600 Med. Pine Tar	lb.	.035	/ .045
R-19, R-21 Resins	lb.	.1075	
Reogen	lb.	.1175	/ .12
Resin C pitch	lb.	.025	/ .0335
R6-3	lb.	.38	/ .40
Resinex	lb.	.0325	/ .0375
L-4	lb.	.0225	/ .03
RPA No. 2	lb.	.65	
No. 3	lb.	.46	
5	lb.	.57	
RSN Flux	gal.	.10	/ .19
Rubberol	lb.	.215	
S-Polymers	lb.	.44	
Santicizer B-16	lb.	.52	/ .57
E-15	lb.	.49	/ .54
M-17	lb.	.46	/ .51
No. 140	lb.	.3225	/ .38
Seedine	lb.	.1485	/ .1705
Softener #20	gal.	.10	/ .20
Solvenol	gal.	.56	/ .58
Staflex IXA	lb.	.36	/ .37
Staybelite Resin	lb.	.06	/ .065
Stearex Beads	lb.	.14⅞	/ .15⅞
Stearic acid, single pressed	lb.	.14	/ .15
Double pressed	lb.	.145	/ .155
Triple pressed	lb.	.1675	/ .1775
Stearite	lb.	.09	/ .10
Syn-Tac	gal.	.33	/ .35
Synthol	lb.	.205	
TR-11	lb.	.035	
Turgum S	lb.	.0875	/ .0975
Tysonite	lb.	.215	/ .2225
Vistac No. 1	gal.	$1.21	/ $1.32
2	gal.	1.62	/ 1.66
4	gal.	1.76	/ 1.80
X-1 Resinous Oil	lb.	.0175	/ .0325
XX-100 Resin	lb.	.0525	

Reclaiming Oils

Bardol 639	lb.	.0225	/ .04
B. R. H. No. 2	lb.	.02	/ .029
B. R. T. No. 4	lb.	.0225	/ .0235
B. R. V.	lb.	.0325	/ .049
BWH-1	lb.	.14	
Dipolymer Oil	gal.	.33	/ .38
Dispersing Oil No. 10	lb.	.0525	/ .055
G. B. Reclaiming Oil	gal.	.12	/ .18
Heavy Resin Oil	lb.	.0225	/ .0375
LX-77	gal.	.18	/ .30
-572	gal.	.23	/ .34
No. 1621	lb.	.025	/ .035
3186	gal.	.28	/ .295
Picco C-10	gal.	.25	/ .30
C-28	gal.	.33	/ .38
C-33	gal.	.20	/ .25
C-42	gal.	.27	/ .32
D-4	gal.	.23	/ .28
E-5	gal.	.21	/ .26
Q-Oil	gal.	.246	/ .296
PT 101 Pine Tar Oil	lb.	.035	/ .045
150 Pine Solvent	gal.	.44	/ .55
Solvenol	gal.	.56	/ .58
S. R. O.	lb.	.015	/ .0225
Wilcor Nos. 111, 151	gal.	.26	/ .30
X-1 Resinous Oil	lb.	.0175	/ .0325
-60 Solvent	gal.	.24	/ .38

Reinforcers, Other Than Carbon Black

BRC 20	lb.	.0125	/ .0135
30	lb.	.011	/ .0195
Bunarex resins	lb.	.06	/ .125
Calcene T	ton	45.00	/ 55.00
Calco S. A.	lb.	.75	
Carbonex	lb.	.0325	/ .0375
644	lb.	.0375	/ .0425
645	lb.	.036	/ .0385
S	lb.	.04	/ .045
S Plastic	lb.	.0385	/ .0435
Clays			
Aluminum Flake	ton	16.00	/ 22.00
No. 5	ton	20.00	
Buca	ton	40.00	
Burgess Iceberg	ton	50.00	
Pigment No. 20	ton	35.00	
No. 30	ton	37.00	
Polyclay	ton	45.00	
Catalpo	ton	30.00	
Crown	ton	14.00	/ 33.00
Dixie	ton	14.00	
Hydratex R	ton	30.00	
L. G. B.	ton	17.00	
Paragon (R)	ton	13.50	/ 31.50
Pigment No. 33	ton	30.00	
Suprex	ton	14.00	/ 32.00
Witco No. 1	ton	14.00	/ 30.00
No. 2	ton	13.50	/ 30.00
Clearcarb	lb.	.1175	/ .1225
Cumar EX	lb.	.0525	
MH	lb.	.065	/ .1175
V	lb.	.0975	/ .1275
Darex Copolymer Nos. 3, X 34	lb.	.35	/ .37
No. X 43	lb.	.36	/ .38
G Resin	lb.	.08	
Good-Rite Resin 50	lb.	.415	/ .455
Hi-Sil	lb.	.15	
Magnesia, Calcined			
Extra Light U. S. P.	lb.	.34	
K&M	lb.	.31	
Light, technical	lb.	.28	
No. 101	lb.	.175	
Heavy, technical	lb.	.05	/ .1275
Medium light, technical	lb.	.12	
Magnesium carbonate	lb.	.09	/ .125
Marbon S, S-1	lb.	.36	/ .43
Millical	ton	27.50	
Multiflex MM	ton	105.00	
Special	ton	125.00	
Neville R Resins	lb.	.10	/ .155
Para Resins 2457, 2718	lb.	.04	/ .045
Picco-75, -100	lb.	.115	/ .17
Piccolastic Resins	lb.	.139	/ .275
Piccolyte Resins	lb.	.15	/ .2075
Piccoumaron Resins	lb.	.06	/ .17
Piccovars	lb.	.12	/ .125
Pliolite, Natural Rubber	lb.	.75	/ .82
Milled	lb.	.85	/ .92
S-2, Milled	lb.	.74	/ .81
S-3, -6	lb.	.36	/ .43
S-6 Masterbatches	lb.	.35	/ .50
PS-60 Resin	lb.	.35	
Resin C Pitch	lb.	.025	/ .0335
Resinex	lb.	.0325	/ .0375
Rubber Resin LM-4	lb.	.28	/ .35
S-Polymers	lb.	.44	
Silene EF	lb.	.055	/ .06
Super Multifex	ton	124.00	
Witcarb R	ton	105.00	/ 120.00
R-12	ton	45.00	/ 66.00
Zinc oxide, commercial†	lb.	.11	/ .135

Retarders

Cumar RH	lb.	.105	
Delac J	lb.	.55	/ .60
E-S-E-N	lb.	.36	/ .41
Good-Rite Vultrol	lb.	.55	/ .57
R-17 Resin	lb.	.1075	
Retarder ASA	lb.	.45	
PD	lb.	.36	
W	lb.	.43	
Retardex	lb.	.51	/ .54
RM	lb.	1.25	
Thionex	lb.	$1.25	
Vultrol	lb.	.50	/ $0.55

Solvents

Benzol, industrial	gal.	.20	/ .21
Bondogen	lb.	.55	/ .60
Carbon bisulfide	lb.	.0445	/ .095
Tetrachloride	lb.	.08	/ .115
Cosol	gal.	.30	/ .38
GVL	lb.	1.00	
Nevsol	gal.	.185	/ .25
Picco Hi-Solv Solvents	gal.	.21	/ .26
PT 150 Pine Solvent	gal.	.44	/ .55
Skellysolve-E	gal.	.153	
-H	gal.	.133	
-R, -V	gal.	.109	
-S	gal.	.099	
Tollac	gal.	.195	/ .25
Toluol, industrial	gal.	.19	/ .25
2-50-W Hi-Flash Solvent	gal.	.37	
Xylol, industrial	gal.	.23	/ .28

Synthetic Resins

Geon Latices (dry wt.)	lb.	.465	/ .60
Paste Resins	lb.	.34	/ .60
Plastics	lb.	.365	/ .85
Polyblend	lb.	.43	/ .58
Polyvinol resins	lb.	.34	/ .58
Marvinol VR-10	lb.	.33	/ .50

Synthetic Rubbers and Latices

Butaprene NAA	lb.	.49	/ .50
NF	lb.	.44	/ .45
NL	lb.	.45	/ .46
NXM	lb.	.52	/ .53
Butaprene Latex (dry wt.) NI, NXM	lb.	.455	/ .49
Chemigum N-1	lb.	.53	/ .60
Chemigum Latex Type 101 (dry wt.)	lb.	.37	/ .40
Hycar OR-15, -15EP	lb.	.52	/ .53
OR-25, -25 EP	lb.	.45	/ .46
OR-25 NS	lb.	.47	/ .48
OS-10	lb.	.50	/ .51
Hycar Latex (dry wt.) 1501, 1531, 1551	lb.	.49	/ .54
1502, 1552, 1562	lb.	.42	/ .47
1532	lb.	.435	/ .485
Neoprene Latex (dry wt.) Type 571, 842 842-A	lb.	.29	/ .40
572, 700	lb.	.30	/ .41
601, 601-A	lb.	.32	/ .43
735	lb.	.36	/ .47
Neoprene Type AC, CG	lb.	.50	/ .53
E	lb.	.65	/ .68
FR, KNR	lb.	.75	/ .78
GN, GN-A, S	lb.	.32	/ .35
RT, W	lb.	.35	/ .38
Paracril 18-80	lb.	.43	/ .45
26NS60, 26NS90	lb.	.44	/ .46
35NS90	lb.	.51	/ .53
Paracril Latex Type H (55%)	lb.	.38	/ .42
Paraplex X-100	lb.	1.00	
Silastic	lb.	2.35	/ 4.05

Tackifiers

Bunarex-10, 25, -40	lb.	.07	/ .125
Contogums	lb.	.0875	/ .11
Galex W-100	lb.	.135	/ .1725
W-100D	lb.	.1325	/ .17
Hercolyn	lb.	.1122	/ .1347
Indopol H-100	gal.	.85	/ 1.00
H-300	gal.	1.12	/ 1.27
Natac	lb.	.10	/ .11
Nevindene	lb.	.125	/ .155
Picco-10, -25	lb.	.12	/ .17
Piccolastic Tackifiers	lb.	.139	/ .275
Piccolyte Resins	lb.	.15	/ .2075
Piccoumaron Resin 427-R	lb.	.12	/ .17
Resins	lb.	.06	/ .17
Staybelite Resin	lb.	.06	/ .065
Synthetic 100	lb.	.41	
Synthol	lb.	.205	
Vistac No. 1	gal.	1.32	
No. 2	gal.	1.66	
4	gal.	1.80	
Vistanex	lb.	.32	

Vulcanizing Agents

Dibenzo G-M-F	lb.	2.65	
Ethyl Tuads	lb.	1.00	
G-M-F	lb.	2.50	
Litharge, commercial	lb.	.1325	/ .1425
Eagle, sublimed	lb.	.1475	/ .1485
Magnesia, calcined	lb.	.29	/ .31
Carey	lb.	.28	
K&M Neoprene Grade	lb.	.31	
Light No. 101	lb.	.175	
Methyl Selenac	lb.	1.60	
Tuads	lb.	1.10	
Red Lead, commercial	lb.	.1525	/ .1675
Eagle	lb.	.1575	
Sulfur flour, comml. 100 lbs.		1.60	/ 2.30
Black Bird	lb.	.036	/ .041
Calco	lb.	.0175	/ .051
Chloride	lb.	.0325	/ .0825
Crystex	lb.	.195	
Insoluble 60	lb.	.13	/ .135
Rubbermakers 100 lbs.		1.75	/ 2.45
Spider Brand	lb.	.023	/ .044
Stauffer	lb.	.0175	/ .0285
Telloy	lb.	2.00	
Vandex	lb.	2.00	
Vultac Nos. 1, 2	lb.	.38	/ .45
No. 3	lb.	.42	/ .49
White lead silicate	lb.	.14⅞	/ .1825
Eagle	lb.	.155	/ .1725

CLASSIFIED ADVERTISEMENTS

Continued

SITUATIONS OPEN (Continued)

SALESMEN—ESTABLISHED CHEMICAL CONCERN REQUIRES experienced men, preferably with chemical education, to contact most industries throughout the Midwest. Our office knows of this ad. Reply in detail, stating age, reference, experience, salary desired. Address Box No. 480, care of INDIA RUBBER WORLD.

TECHNICAL SALES REPRESENTATIVE FOR SYNTHETIC RESins and adhesives. Furnish full particulars in first letter. All replies treated confidentially. Address Box No. 482, care of INDIA RUBBER WORLD.

MACHINERY & SUPPLIES FOR SALE

FOR SALE: 1—WATSON STILLMAN LOW AND HIGH HYDRO-Pneumatic Accumulator (3000#) pressure with pumps, motors, and accessories. 1—48 x 48" 3-opening Hydraulic Press with 4-16" rams; other presses, various sizes. 1—6' x 24' Vulcanizer, 100# pressure, quick-opening door. 6 Royle and other Tubers 2½" to 8". Also mills, calenders, etc. Send us your inquiries. CONSOLIDATED PRODUCTS CO., INC., 13-16 PARK ROW, NEW YORK 7, NEW YORK, Telephone BArclay 7-0600.

FOR SALE: One new H. K. Porter #8—72" diameter double-end cone blender, stainless steel with foundation supports and 5 H.P. gear head, magnetic brake drive motor. Never removed from original crate. Purchased late 1947. To be sold to highest bidder. F.O.B. Kearny, N. J. We reserve right to reject any and all bids. Forward bids in duplicate to Western Electric Co., Inc., 100 Central Ave., Kearny, N. J. Att: Purchasing Dept.

FOR SALE: THREE-ROLL 22" X 60" RUBBER CALENDER, COMplete with 75 h.p. motor and drive. Calender roll has been ground recently, and entire calender is in A-1 shape. Your inspection invited. NIXON NITRATION WORKS, Nixon, N. J.

FOR SALE: ALL PRICES REDUCED. COLTON #5½T PREFORM Tablet machine 3". Farrel 18" x 45", 16" x 48" & 15" x 36" 2-roll Rubber Mills, also new Lab. 6" x 12" & other sizes up to 84". Rubber Calenders. Extruders 2" to 6". Ball & Jewell Rotary Cutters. Baker Perkins 200-gal. & 100-gal. heavy-duty double-arm, jack. Mixers, also 9 and lab. 0.7 gals. Large stock Hydraulic Presses from 12" x 12" to 42" x 48" platens from 50 to 1500 tons. Hydraulic Pumps & Accumulators. Injection Molding Machines 1 to 28 oz. Stokes & Colton single-punch & rotary preform Tablet Machines, ½" to 3". Banbury Mixers. Grinders & Crushers, etc. SEND FOR SPECIAL BULLETIN. WE BUY YOUR SURPLUS MACHINERY. STEIN EQUIPMENT COMPANY, 90 WEST STREET, NEW YORK 6, NEW YORK.

SURPLUS MACHINERY

One Coulter Volumetric Cutting Press, Model "A1", complete with 1 Reeves Variable Drive complete with motor & control and necessary "V" belts.

Six Double Storage Richardson Bins equipped with a total of 12 valves so arranged to be used as 12 bins. One Tramcar complete with scales and electrical equipment. Extra-long rails. 17 Scoop bins complete with lift covers, bag supports screens, drip pans, scoops, floor supports and aprons.

One HPM 450-ton press with two cousino heads.

ACUSHNET PROCESS COMPANY
P. O. Box 965
New Bedford, Massachusetts

FOR SALE: HEAVY-DUTY DOUBLE-ARM MIXERS: 2½-LB. lab. size, 25-gal., 100-gal., and 150-gal. working cap. Stokes rotary 16-punch pellet presses. PERRY EQUIPMENT CORP., 1524 W. Thompson St., Phila. 21, Pa.

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RUBBER MACHINERY
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22" x 60"
22" x 50" (several)
16" x 48"
14" x 36"
12" x 24"
6" x 12"

PRESSES
42 x 84—2-24" rams
26 x 50—5-opening 2-12" rams
40 x 40—4-opening 16" ram
32 x 32—6-opening 16" ram
24 x 24—2-opening 18" ram

CALENDERS
28" x 78"
20" x 60" (almost new)
18" x 48"
16 x 42—5-roll
12 x 30
5 x 14—4-roll

BANBURY MIXERS
#9, #3, #1 & midget

EXTRUDERS
1", 2½", 3¼", 4½", 6" & new National Rubber 8"

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UNITED RUBBER MACHINERY EXCHANGE
NEW ADDRESS: 183-189 ORATON ST. CABLE "URME" NEWARK 4, N. J.

(*Classified Advertisements Continued on Page 375*)

United States Imports, Exports, and Reexports of Crude and Manufactured Rubber

	August, 1949 Quantity	Value
Exports of Domestic Merchandise		
UNMANUFACTURED, Lbs.		
Chicle and chewing gum bases	284,590	$134,370
Balata	500	1,610
Synthetic rubbers: GR-S	155,698	41,700
Butyl	5,720	1,015
Neoprene	534,574	187,514
Nitrile	126,678	61,311
"Thiokol"	3,000	1,712
Polyisobutylene	20,934	3,278
Other	14,176	3,221
Reclaimed rubber	1,370,267	103,565
Scrap rubber	1,774,453	65,652
TOTALS	4,290,590	$604,948
MANUFACTURED		
Rubber cement ..... *gals*	66,203	$123,971
Rubberized fabric: auto cloth ..... *sq. yds.*	9,620	9,016
Piece goods and hospital sheeting ..... *sq. yds.*	57,183	37,151
Rubber footwear:		
Boots ..... *prs.*	1,666	9,336
Shoes ..... *prs.*	3,746	6,643
Rubber-soled canvas shoes ..... *prs.*	35,894	53,956
Soles ..... *doz. prs.*	33,807	67,603
Heels ..... *doz. prs.*	50,078	37,716
Rubber soling and top-lift sheets ..... *lbs.*	179,677	27,006
Gloves and mittens ..... *doz. prs.*	9,954	35,974
Drug sundries: hot water bottles and fountain syringes ..... *no.*	22,985	15,669
Other	.....	185,737
Rubber and rubberized clothing	.....	80,151
Balloons	.....	36,668
Rubber toys and balls ...	.....	27,510
Erasers ..... *lbs.*	9,884	9,095
Hard rubber goods:		
Battery boxes ..... *no.*	20,619	19,870
Other electrical goods ..... *lbs.*	109,794	64,950
Combs, finished .... *doz.*	3,981	7,663
Other	.....	8,845
Tires and casings:		
Truck and bus ..... *no.*	86,541	3,153,448
Auto ..... *no.*	46,783	626,223
Aircraft	.....	115,312
Farm tractor, etc ... *no.*	8,868	280,274
Other off-the-road .. *no.*	2,999	278,657
Bicycle ..... *no.*	10,322	12,444
Motorcycle ..... *no.*	1,327	31,594
Other ..... *no.*	2,846	45,646
Inner tubes: auto, truck, bus ..... *no.*	71,862	229,130
Other ..... *no.*	14,281	49,474
Solid tires: truck and industrial ..... *no.*	2,946	102,466
Other ..... *lbs.*	5,453	2,407
Tire repair materials: camelback ..... *lbs.*	156,341	42,666
Other ..... *lbs.*	179,794	98,492
Rubber and friction tape ..... *lbs.*	23,186	15,812
Belting: auto and home ..... *lbs.*	54,426	63,320
Transmission:		
V-belts ..... *lbs.*	79,786	133,181
Flat belts ..... *lbs.*	20,651	30,558
Other ..... *lbs.*	30,913	36,417
Conveyer and levitator ..... *lbs.*	75,044	58,555
Other ..... *lbs.*	7,052	12,817
Hose and tubing ..... *lbs.*	444,346	337,858
Rubber packing ..... *lbs.*	163,916	142,365
Mats, flooring, tiling *lbs.*	561,856	140,673
Thread: bare ..... *lbs.*	34,550	46,335
Textile covered ... *lbs.*	12,458	30,925
Gutta percha manufactures ..... *lbs.*	14,100	6,759
Latex and other compounded rubber for further manufacture. . *lbs.*	293,056	99,095
Other natural and synthetic rubber manufactures	.....	355,257
TOTALS	.....	$7,432,690
GRAND TOTALS, ALL RUBBER EXPORTS ...	.....	$8,037,638
Reexports of Foreign Merchandise		
UNMANUFACTURED, Lbs.		
Crude rubber	562,828	$110,368
MANUFACTURED		
Rubber toy and novelty balloons	.....	$560
Toys and balls	.....	8,517
TOTALS	.....	$9,077
GRAND TOTALS, ALL RUBBER REEXPORTS.	.....	$119,445

	August, 1949 Quantity	Value
Imports for Consumption of Crude and Manufactured Rubber		
UNMANUFACTURED, Lbs.		
Crude rubber	184,951,387	$15,828,526
Rubber latex	6,105,826	1,342,109
Balata	306,033	66,002
Jelutong or Pontianak ...	254,707	96,509
Gutta percha	11,200	2,218
Chicle	9,592	3,020
Synthetic rubber	3,907,778	719,754
Scrap rubber	1,005,765	20,251
TOTALS	196,552,288	$18,078,389
MANUFACTURED		
Tires: auto, bus, truck *no.*	251	$2,337
Bicycle ..... *no.*	1,116	1,356
Other ..... *no.*	4	605
Inner tubes: auto, etc. *no.*	177	412
Rubber footwear: shoes and overshoes .... *prs.*	12,113	14,515
Rubber-soled canvas shoes ..... *prs.*	2,169	789
Athletic balls: tennis .. *no.*	1,200	403
Other, except golf .. *no.*	62,741	6,293

	August, 1949 Quantity	Value
MANUFACTURED RUBBER IMPORTS *(Cont'd)*		
Rubber toys, except balloons	.....	$23,221
Hard rubber products	.....	91
Rubberized printing blankets ..... *lbs.*	499	695
Rubber and cotton packing ..... *lbs.*	221	1,583
Gaskets and valve packing	.....	131
Belting ..... *lbs.*	7,553	11,021
Hose and tubing	.....	1
Drug sundries	.....	1,191
Rubber instruments . *doz.*	60	187
Other rubber products	.....	136
Gutta percha manufactures ..... *lbs.*	920	673
Rubber bands ..... *lbs.*	1,835	933
Synthetic rubber products	.....	18
Other soft rubber manufactures	.....	32,518
TOTALS	.....	$99,109
GRAND TOTALS, ALL RUBBER IMPORTS	.....	$18,177,498

SOURCE: Bureau of Census, United States Department of Commerce, Washington, D. C.

United States Rubber Statistics—August, 1949

(All Figures in Long Tons, Dry Weight)

	New Supply Production	Imports	Total	Distribution Consumption	Exports	Month-End Stocks
Natural rubber, total	0	41,853	41,853	41,788	251	92,838
Latex, total	0	2,726	2,726	3,519	0	7,012
Rubber and latex, total	0	49,579	49,579	45,307	251	99,850
Synthetic rubber, total	*29,407	1,745	35,630	34,419	369	111,333
	†4,478					
GR-S	*24,932	1,570	27,245	27,072	70	90,820
	†743					
Neoprene	†2,857	0	2,857	2,690	239	3,716
Butyl	*4,475	175	4,650	3,843	3	13,540
Nitrile	†878	0	878	814	57	3,257
Natural rubber and latex, and synthetic rubber, total	33,885	51,324	85,209	79,726	620	211,183
Reclaimed rubber, total	17,813	0	17,813	19,297	612	27,526
GRAND TOTALS	51,698	51,324	103,022	99,023	1,232	238,709

*Government plant production.
†Private plant production.
SOURCE: Rubber Division, ODC, United States Department of Commerce, Washington, D. C.

Estimated Automotive Pneumatic Casings and Tube Shipments, Production, Inventory, September, August, 1949; First Nine Months, 1949, 1948

	September, 1949	% of Change from Preceding Month	August, 1949	First Nine Months, 1949	First Nine Months, 1948
Passenger Casings					
Shipments					
Original equipment	2,832,405		2,932,758	21,906,034	15,702,390
Replacement	2,944,817		3,807,181	28,392,891	33,266,843
Export	44,457		39,797	355,236	476,194
TOTAL	5,821,679	−14.13	6,779,736	50,654,161	49,445,427
Production	4,950,533	−10.61	5,538,251	49,103,085	51,629,758
Inventory end of month	7,123,460	−10.12	7,925,593	7,123,460	7,847,949
Truck and Bus Casings					
Shipments					
Original equipment	213,098		258,064	2,808,607	4,072,081
Replacement	614,982		655,331	5,015,800	5,890,939
Export	69,203		74,810	725,557	850,642
TOTAL	897,283	− 9.20	988,205	8,549,964	10,813,662
Production	644,031	− 6.68	690,148	8,433,333	11,163,906
Inventory end of month	1,812,905	−11.31	2,044,067	1,812,905	1,954,254
Total Automotive Casings					
Shipments					
Original equipment	3,045,503		3,190,822	24,714,641	19,774,471
Replacement	3,559,799		4,462,512	33,408,691	39,157,782
Export	113,660		114,607	1,080,793	1,326,836
TOTAL	6,718,962	−13.50	7,767,941	59,204,125	60,259,089
Production	5,594,564	−10.18	6,228,399	57,536,418	62,793,664
Inventory end of month	8,936,365	−10.37	9,969,660	8,936,365	9,802,203
Passenger and Truck and Bus Tubes					
Shipments					
Original equipment	3,007,260		3,190,391	24,661,825	19,766,720
Replacement	2,765,483		3,351,436	24,990,597	31,999,414
Export	69,240		61,526	699,696	820,516
TOTAL	5,841,983	−11.53	6,603,353	50,352,118	52,586,650
Production	4,902,319	− 5.17	5,169,382	49,810,679	53,218,468
Inventory end of month	8,916,268	− 9.56	9,858,385	8,916,268	8,747,523

NOTE: Cumulative data on this report include adjustments made in prior months.
SOURCE: The Rubber Manufacturers Association, Inc., New York, N. Y.

CLASSIFIED ADVERTISEMENTS

Continued

MACHINERY & SUPPLIES FOR SALE (Cont'd)

FARREL-BIRMINGHAM MIXING MILLS
18 x 48" and 16 x 40" 2-Roll Mills including 300 HP Gear reduction drive.
CHEMICAL & PROCESS MACHINERY CORP.
146 GRAND STREET, NEW YORK 13, NEW YORK

MACHINERY AND SUPPLIES WANTED

WANTED: COMPLETE RUBBER PLANTS, ALSO INDIVIDUAL items such as 2-roll mills, calenders, mixers and Banbury mixers. Address Box No. 472, care of INDIA RUBBER WORLD.

WANTED: No. 2 RUBBER EXTRUDER, COMPLETE WITH head and motor. Address Box No. 481, care of INDIA RUBBER WORLD.

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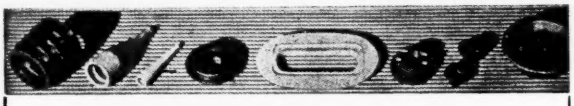

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Designers and Builders of
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Cord Latexing, Expanding Mandrels, Automatic Cutting, Skiving, Flipping and Roll Drive Wrapping Machines.
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SUB-ZERO ROTARY TUMBLER
(Deflashing by Cold Tumbling)

HIGH-SPEED TRIMMER
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Division of
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WE SPECIALIZE IN MOLDS FOR
Heels, Soles, Slabs, Mats, Tiling and Mechanical Goods

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NATIONAL SHERARDIZING & MACHINE CO.
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Representatives
Akron San Francisco New York

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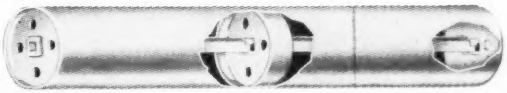

ALL STEEL, ALL WELDED CONSTRUCTION, with forged steel hubs for 1¼", 1½" and 2" square bars. 4", 5", 6", 8", 10", 12", 15", 20" and 24" diameters. Any length. Also Special Trucks (Leaf Type) Racks, Tables and Jigs.

Used in manufacturing rubber and plastic products.

THE W. F. GAMMETER COMPANY
CADIZ, OHIO

FINANCIAL

American Cyanamid Co., New York, N. Y., and subsidiaries. First nine months, 1949: net income, $10,796,526, equal to $3.94 a common share, against $10,353,762, or $3.78 a share, in the 1948 months; net sales, $173,011,470, against $171,865,979.

American Zinc, Lead & Smelting Co., Columbus, O., and wholly owned subsidiaries. Nine months to September 30: net profit, $788,230, equal to 79¢ a common share, against $416,713, or 24¢ a share, in the corresponding period of 1948; net sales, $25,466,398, against $29,269,636.

Baldwin Locomotive Works, Philadelphia, Pa., and wholly owned subsidiaries. Nine months ended September 30: net profit, $2,297,098, equal to 92¢ each on 2,375,553 common shares, compared with $2,443,797, or 98¢ a share, in the like period last year; sales, $92,852,937, against $89,676,732; income taxes, $1,805,000, against $1,560,000.

Belden Mfg. Co., Chicago, Ill. First nine months, 1949: net income, $275,596, equal to 86¢ a share, against $639,456, or $1.99 a share, in the like period last year.

Brunswick-Balke-Collender Co., Chicago, Ill., and subsidiaries. Nine months ended September 30: net profit, $1,323,587, equal to $2.75 each on 450,000 common shares contrasted with $1,758,884, or $3.69 a share, in the 1948 months; net sales, $21,510,086, against $23,090,953; federal income taxes, $1,015,000, against $1,200,000.

Columbian Carbon Co., New York, N. Y. First nine months, 1949: consolidated net income, $4,621,475, equal to $2.87 a share, against $4,822,626, or $2.99 a share, in the 1948 months.

Cooper Tire & Rubber Co., Findlay, O. First nine months, 1949: net loss, $182,283, compared with loss of $55,385 in the 1948 period.

Crown Cork & Seal Co., Inc., Baltimore, Md., and wholly owned domestic subsidiaries. First three quarters, 1949: net income, $1,185,979, equal to $1.14 each on 1,207,790 common shares, contrasted with $4,114,876, or $3.07 a share, in the 1948 quarters; net sales, $64,791,615, against $76,815,928; federal income tax, $1,130,752, against $2,600,275.

DeVilbiss Co., Toledo, O., and wholly owned subsidiaries. Nine months ended September 30: net profit, $267,568, equal to 89¢ each on 300,000 capital shares, contrasted with $460,969, or $1.53 a share, in the corresponding period of 1948; federal tax provision, $262,000, against $341,700.

Flintkote Co., New York, N. Y., and subsidiaries. January 1-October 8, 1949: net income, $4,303,321, equal to $3.20 each on 1,257,935 common shares, compared with $6,480,671, or $4.92 a share, in the corresponding period of 1948; net sales, $52,053,137, against $64,683,038.

E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., and wholly owned subsidiaries. First three quarters, 1949: net profit, $135,994,725, equal to $2.85 each on 44,788,151 common shares outstanding, contrasted with $101,570,845, or $2.09 each on 44,600,552 shares, in the preceding year's quarters; federal tax provisions, $81,750,000 against $63,890,000.

General Motors Corp., Detroit, Mich. Nine months to September 30: consolidated net income, $502,414,029, equal to $11.21 a common share, compared with $327,155,222, $7.22 a share, in last year's period; sales, $4,458,079,585, against $3,436,331,992; income taxes, $366,472,000, against $260,385,000.

B. F. Goodrich Co., Akron, O., and subsidiaries. Nine months ended September 30: net income, $12,451,690, equal to $8.34 a common share, contrasted with $16,586,027, or $11.50 a share, a year earlier; net sales, $283,393,796, against $309,422,823; reserve for contingencies, etc., $3,000,000, against $5,000,000.

Hewitt-Robins, Inc., New York, N. Y. First three quarters, 1949: net earnings, $336,119, equal to $1.21 each on 278,714 capital shares, contrasted with $390,186 a year earlier; sales, $14,648,272, against $13,859,782.

Johns-Manville Corp., New York, N. Y., and subsidiaries. Nine months to September 30: consolidated net earnings, $10,433,027, equal to $3.52 a common share, against $10,845,218, or $3.67 a share, in the 1948 months; sales, $119,313,554, against $122,339,639.

National Automotive Fibres, Inc., Trenton, N. J., and wholly owned subsidiaries. Nine months ended September 30: net profit, $3,680,999, equal to $3.69 each on 996,152 common shares, compared with $2,049,459, or $2.15 each on 953,779, shares, in the corresponding period of 1948; net sales, $50,382,516, against $36,123,543; federal and Canadian income taxes, $2,396,975, against $1,340,828.

Byron Jackson Co., Los Angeles, Calif. Nine months ended September 30: net profit, $1,136,839, equal to $3 a share, against $1,456,532, or $3.84 a share, a year earlier.

Johnson & Johnson, New Brunswick, N. J., and domestic subsidiaries. Nine months ended September 30: net income, $6,960,830, equal to $3.52 a common share, against $8,515,810, or $4.58 a share, in the 1948 period; net sales, $101,419,112, against $100,372,584.

Koppers Co., Inc., Pittsburgh, Pa. First nine months, 1949: net income, $5,356,242, equal to $3.03 each on 1,617,125 common shares, contrasted with $6,831,770, or $5.67 each on 1,125,825 shares, a year earlier; net sales, $148,912,973, against $144,615,188.

Monroe Auto Equipment Co., Monroe, Mich. Year ended June 30: net profit, $860,000, equal to $2.16 a common share, compared with $539,891, or $1.18 a share, in the preceding fiscal year; net sales, $18,069,733, against $13,330,782.

Minnesota Mining & Mfg. Co., St. Paul, Minn., and subsidiaries. First nine months, 1949: net profit, $9,942,407, equal to $4.89 each on 1,972,845 common shares, compared with $9,358,641, or $4.64 each on 1,951,530 shares, a year earlier; net sales, $83,200,660, against $79,841,184.

Monsanto Chemical Co., St. Louis, Mo. First three quarters, 1949: net income, $11,555,833, equal to $2.48 a common share, against $11,568,483, or $2.51 a share, in the like period last year; net sales, $121,372,141, against $119,382,197.

Union Carbide & Carbon Corp., New York, N. Y., and subsidiaries. First nine months, 1949: net income, $66,429,392, equal to $2.30 a capital share, compared with $73,596,110, or $2.55 a share, in the 1948 period; net sales, $434,523,727, against $463,299,272; income taxes, $38,468,292, against $44,395,365.

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Bearfoot Sole Co., Inc.	Cap.	$6.00 annual	Nov. 18	.....
Belden Mfg. Co.	Com.	0.20	Dec. 1	Nov. 17
Boston Woven Hose & Rubber Co.	Pfd.	3.00 s.	Dec. 15	Dec. 1
Brown Rubber Co.	Com.	0.25 q.	Dec. 1	Nov. 18
Brunswick-Balke-Collender Co.	Com.	1.25 yr. end	Dec. 15	Dec. 1
►◄	Pfd.	1.25 q.	Jan. 3	Dec. 20
Canada Tire Corp.	Com.	0.30 q.	Dec. 1	Nov. 19
Canada Wire & Cable Co., Ltd.	A	1.00	Dec. 15	Nov. 30
	B	0.50	Dec. 15	Nov. 30
Flintkote Co.	Com.	0.50 yr. end	Dec. 10	Nov. 26
	Com.	0.50 q.	Dec. 10	Nov. 26
►◄	Pfd.	1.00 q.	Dec. 15	Dec. 1
General Motors Corp.	Com.	4.25 yr. end	Dec. 10	Nov. 17
	$5 Pfd.	1.25 q.	Feb. 1	Jan. 9
	$3.75 Pfd.	0.93¾ q.	Feb. 1	Jan. 9
General Tire & Rubber Co.	Com.	0.25 q.	Nov. 30	Nov. 18
B. F. Goodrich Co.	Com.	1.50 yr. end	Dec. 31	Dec. 14
	Com.	1.00 q.	Dec. 31	Dec. 14
	Pfd.	1.25 q.	Dec. 31	Dec. 14
Johns-Manville Corp.	Com.	1.30 yr. end	Dec. 9	Nov. 28
Johnson & Johnson	Com.	0.20 extra	Dec. 12	Nov. 28
	Com.	0.30 q.	Dec. 12	Nov. 28
Minnesota Mining & Mfg. Co.	Com.	0.70	Dec. 12	Nov. 28
	Pfd.	1.00 q.	Dec. 12	Nov. 28
Raybestos-Manhattan, Inc.	Com.	1.00 yr. end	Jan. 3	Dec. 12
Tyer Rubber Co.	$4.25 Pfd.	1.06¼ q.	Nov. 15	Nov. 7
Union Asbestos & Rubber Co.	Com.	0.25 q.	Jan. 2	Dec. 10
United States Rubber Co.	Com.	0.50	Dec. 10	Nov. 21
	Pfd.	2.00 q.	Dec. 10	Nov. 21

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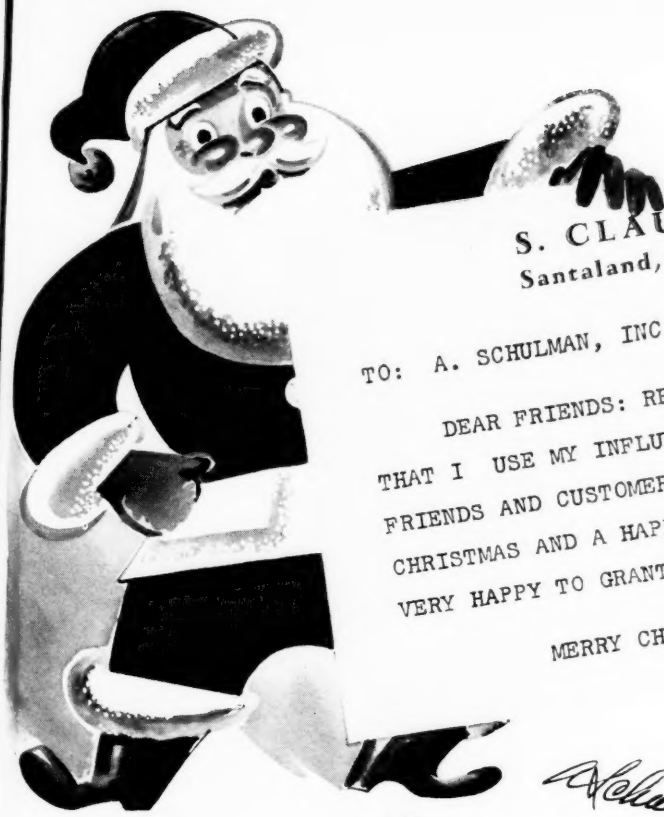

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